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THE RELATION OF DIABETES MELLITUS AND CHOLELITHIASIS*

Chemical and X-Ray Analysis of Calculi

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THE problem of gall stones is one on which a very large number of investigations have been carried out and yet it is one about which so much remains unknown and about which so little seems to be certain in regard to its etiology that one is almost forced to discuss such a subject with a considerable amount of reserve.

INTRODUCTION

Theories of Gall Stone Formation

Many theories for the formation of gall stones have been advanced to explain the riddle of the factors involved in producing this curious disease. While there is considerable difference of opinion in the various theories most of the recent ones disagree with Naunyn's teachings.

Naunyn firmly adhered to the belief that the causes of gall stone formation were infection and bile stasis and that the cholesterol and calcium of the stone were secretory products or products of decomposition of the inflamed mucous membrane of the gall bladder and biliary ducts.

Aschoff and Bacmeister did not accept Naunyn's views in regard to the infectious origin of pure cholesterol and pure pigment stones but pointed to the fact that such stones were produced as a result of some metabolic disturbance.

However, the theory of the infectious origin of gall stones has not completely lost its followers. Walton claims that in a large number of cases the history dates back to an infection and from his studies he found that in every case in which calculi other than the pure pigment type have been removed, there has always been evidence of a chronic inflammatory change in the gall bladder. Walton very definitely disagrees with the idea that pure cholesterol stones are primary and not formed from past infection. In his experience of twenty-three cases of pure cholesterol stones, in every case there were inflammatory changes in the gall bladder (8 acute and 15 chronic cholecystitis).

Many investigators hold to the view that biliary stasis is the primary factor in gall stone formation. The studies of Rovsing apparently entirely disprove Naunyn's theory that gall stones are deposited in consequence of infection. Out of 320 cases he found the gall bladders completely sterile in 54% without a trace of infection. Of the cases in which a single large stone was found, over 50% of the gall bladders were aseptic. Rovsing advanced the idea that all the phenomena connected with cholelithiasis are logically explained by precipitation as the result of thickening of the bile under some temporary condition inducing transient inspissation.

Oliver points out that the steps in the formation of gall stones are a bile stasis, which is probably most frequently brought about by infection, and an impairment of liver function so that bile salts are not normally excreted into the bile. As a result of the deficiency of bile salts in the bile, cholesterol tends to settle out of solution.

Whitaker states that on the whole recent studies confirm the old opinion that stasis is an essential factor in gall stone formation. Chirary et al. feel that it is possible that the colloidal instability of cholesterol is due to an insufficient secretion of bile salts and that cholelithiasis is due rather to a disturbed liver secretion than to a primary affection of the biliary tract.

In a series of investigations Andrews, Schoenheimer and Hrdina point out that cholesterol is held in solution in the bile in the form of a bile salt-cholesterol complex. These complexes have been made in the laboratory from pure bile salts and have been isolated from human bile. The normal wall of the gall bladder does not allow the passage of bile salts through it without cholesterol. When the mucosa is diseased the bile salts decrease and cholesterol greatly increases. The ratio of bile salts to cholesterol in the bladder bile from cases of cholelithiasis is much lower than it is in the normal gall bladder showing that some factor has caused an increase of the cholesterol content of the bile in relation to the bile salts. These workers maintain that "cholesterol stones are due to a faulty differential absorption of

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the bile acids and cholesterol by the abnormal gall bladder."

According to Reinhold and Ferguson the occurrence of gall stones is not associated with a consistent change in the H ion concentration of the gall bladder bile.

Halpert advances a new theory for the formation of gall stones and a new classification of calculi. His views are partly in line with those of Andrews, Schoenheimer and Hrdina in that a disturbance of the resorptive power of the mucous membrane of the gall bladder is a factor leading to biliary stasis. Halpert views the gall bladder "not as a reservoir to supply concentrated bile to the intestine but an organ the function of which is the returning of important constituents of the bile into circulation, i.e., through the mucosa of the gall bladder to the veins and lymphatics to the liver and general circulation." The story of the formation of gall stones is then briefly as follows: "A disturbed function of the gall bladder or an abnormal composition of the bile or both lead to a stagnation of the bile in the gall bladder. The result of the functional stasis is the formation of gall stones. The type of concretion or concretions formed depends on the kind of functional biliary stasis which produced them. In a hepatogenous or exogenous stasis (due to disturbed or altered functioning of the liver—gall bladder may be perfectly normal) of the bile in the gall bladder 'pure gall stones' ([a] cholesterol, [b] biliary pigment) form; in a cystogenous stasis (functional disturbance or pathological condition of gall bladder) 'mixed gall stones' form ([a] cholesterol + $CaCO_3$, [b] cholesterol + Ca bilirubin, [c] cholesterol bilirubin + $CaCO_3$, [d] cholesterol + Ca bilirubin + $CaCO_3$); and in a chronic stasis (both a disturbed function of the liver and a pathological condition of the gall bladder) 'combined gall stones' form. Stones of pure cholesterol usually occur in normal gall bladders the mucosa of which may show signs of the resorption of cholesterol."

The Association of Hypercholesterolemia and Cholelithiasis

Another view of the origin of gall stones which has been warmly advocated by Chauffard is that stones are formed when there is an excess of cholesterol excreted into the bile. If any chemical change is responsible it is likely to be concerned with cholesterol metabolism as that is the main constituent of most human gall stones.

There seem to be numerous contradictory findings of different workers with respect to the relation of hypercholesterolemia in cholelithiasis. Some investigators,—Robinson, Campbell, Wilensky, Gardner and Gainsborough, and Alexandresco-Dersca et al., believe that there is no relation. Campbell claims that his investigations lend no support to the theory that the formation of gall stones is caused by a raised cholesterol concentration of the blood. Wilensky points out that owing to the influence of diet, diseases such as nephritis, diabetes, arteriosclerosis, also pregnancy, etc., the cholesterol content of the blood varies. In heightening the blood cholesterol value it is not possible to utilize cholesterol as a diagnostic factor except rarely in differentiating jaundice due to biliary obstruction and that caused by cirrhosis of the liver. Alexandresco-Dersca et al. while maintaining that hypercholesterolemia does not constitute a pathological sign for the diagnosis of gall stones find that in connection with other symptoms it does aid in fixing the diagnosis of biliary lithiasis.

On the other hand several groups of workers show that there is a relation between hypercholesterolemia and gall stones. Chauffard claims that in most, if not in all, cases of gall stones the amount of cholesterol in the blood is increased above normal. Henes states that a hypercholesterolemia seems to be the fundamental and primary etiologic factor in the formation of gall stones. In cases of cholelithiasis without fever an hypercholesterolemia is invariably found and this hypercholesterolemia persists for a considerable length of time after the operative removal of the stones.

By increasing the quantity of cholesterol in the blood of rabbits through feeding them on cholesterol and in other ways, Hansen found that the cholesterol content in the bile was increased and that in such animals cholesterol is precipitated in the gall bladder.

Judd and Mentzer have shown that 26% of gall bladders removed exhibit cholesterosis. In examining the blood cholesterol content of more than 200 patients with cholesterosis of the gall bladder Mentzer found an appreciable increase over the normal in about every case. Numerous samples of blood must be taken from the patient over long periods of time. While gall stones are not necessarily a significant accompaniment of cholesterosis (stones found in about 60%) Judd and Mentzer point out that in 30% of 500 cases in which there were stones, the stones were single. In 99% of all the cases the stones were of the cholesterin-rich type. This lends support to the theory that cholesterosis is primarily a metabolic disturbance.

Pacini has found that there was a relative increase of cholesterol in the plasma of all the cases of cholelithiasis. Babarczy has shown that the cholesterol concentration is normal in the blood during the interval between attacks but that it increases immediately after the onset of each attack and remains high for about one week. This elevation is so characteristic of this

condition that this method can be used in the differential diagnosis of cholelithiasis.

The conclusion drawn by Fowweather and Collinson in a study of this subject is that "an hypercholesterolemia is typically present in the acute stages of the disease responsible for gall stone formation and that it disappears with the passing of an acute attack. Its diagnostic value is not that it indicates the presence of gall stones but that it indicates a present or recent attack of the disease. Our views show how gall stones may be formed without an accompanying hypercholesterolemia and suggest that apparently varying and contradictory findings of different workers with respect to hypercholesterolemia in cholelithiasis may simply be due to the fact that examinations have been made in different stages of the disease."

Chamberlain points out that there seems little doubt that the formation of gall stones is to be attributed to some disturbance in cholesterol metabolism, but the evidence is not sufficient as yet to indicate decisively the nature of this disturbance.

The Relation of Diabetes and Cholelithiasis

Thus with the later views of the metabolic origin of the pure cholesterol type of gall stone and the evidence for the association of hypercholesterolemia and the formation of gall stones, it perhaps might seem logical to suppose that in diabetes in which in the past there was usually an hypercholesterolemia, the etiology of the pure cholesterol type of gall stone might be greatly influenced by the diabetic condition.

Rowlands states that about 10% of the population suffers from gall stones and as Joslin has pointed out gall stones are about 50% more frequent in diabetics over 25 years of age than in a similar group in the community.

Apparently some earlier workers were unaware of the frequency of gall stones among diabetics for Campbell mentions that while there is a large amount of cholesterol in the blood in cases of diabetes and in some types of nephritis there is no tendency for gall stone formation to be associated with these diseases. Also Fowweather and Collinson state that "it is a well known fact, however, that diabetics who, owing to diet restrictions, eat a comparatively large amount of foods rich in cholesterol develop an hypercholesterolemia which is frequently of a degree much higher than that found in patients with gall stones, yet we are not aware that these diabetics have a comparatively increased tendency to develop gall stones."

Gall stones are much more frequent among women than men and in this connection it is interesting to note that females are now showing a higher incidence of diabetes than men. Annemaria Schretzenmayr, in studying the relation between the constitution and gall stones, found from 1210 cases at the Kaiserinin Elizabeth Hospital in Wein, 202 cases with gall stones (16.6%). Of these 136 were women and 66 men. The figures on the relation between diabetes and gall stones showed that in the women gall stones were about 2½ times more prevalent in the diabetics than in the non-diabetics, while for the men the ratio was about 1½. Of special interest in the case of the diabetics is the fact that nearly ½ of the stones were of pure cholesterol.

Figures given by Joslin show that in 50 out of 211 cases (about 24%) of diabetics who were 25 years of age or over the gall bladder contained calculi. In a study of the simultaneous occurrence of diabetes and various forms of lithiasis Molnár found out of 323 diabetic patients at Karlsbad 72 or 22.3% with cholelithiasis; Wöhrnann found out of 677 diabetics 160 or 24% with gall bladder disease, and Katsch in a study of 36 diabetics observed 14 or 38.8% with gall bladder disease.

Many other investigators seem convinced of the relationship between diabetes and cholelithiasis. Singer cites examples to illustrate an inner relationship between diabetes mellitus and gall stones. Lahey points to the high percentage of cases of gall stones associated with diabetes. In 68 diabetic patients Jones et al. observed that cholelithiasis, as diagnosed by examination of duodenal sediment, occurred in 19% of the cases. They believe that the existing figures for the incidence of gall stones in diabetics is far too low. It is possible that at least 1/5 of all diabetic patients over 40 years of age have an associated cholelithiasis.

Katsch has the impression that cases of diabetes on the basis of gall bladder disease are much more frequent than is usually supposed. He feels, however, that these cases are usually comparatively mild. Joslin also points out the mildness of the gall stone variety of diabetes. He likewise states that "gall stones often precede diabetes and may precipitate it by direct extension of infection to the head of the pancreas. This seems likely because there the islands of Langerhans are few and the gall stone type of diabetes mild."

In a large series of cases Judd and Mentzer observed that pancreatitis was diagnosed in 11% of the stone free and in 16% of the gall stone cases. Collins found that there were pathological gall bladders in 33% of a group of diabetic patients and that the females outnumbered the males 54 to 19.

In a statistical study of cholelithiasis Gross mentions that the question of the possible relationship between gall stones and diabetes is one to which he found no reference in the literature. His observations, however, show a direct relationship between gall stones and diabetes. The

data which he presents will be discussed in the latter part of this paper.

Certain races are more subject to gall stones than others and in such instances hypercholesterolemia is usually present. On the other hand cholelithiasis is rare in Dutch East India. There the cholesterol content of the blood serum of the natives is 25-50% lower than that of Europeans and the wealthy natives. It is emphasized that diabetes and chronic nephritis are also rare among the natives.

It may be that the association of gall stones and diabetes is dependent upon some antecedent perverted fat metabolism. Bloor has shown that some of the fat of the blood is transported as cholesterol esters of the fatty acids and the alcohol cholesterol. It may be that when this purpose is accomplished cholesterol becomes a waste product and is excreted by way of the bile.

Joslin maintains that the type of gall stone may be an argument for the common origin of gall stones. It would seem from the previous discussion that if it were found that the percentage of cholesterol in the stones from diabetics was notably greater than in the stones from non-diabetics then the point would be established.

With this idea in mind a chemical, and in addition an x-ray, analysis of gall stones from a group of diabetic patients as well as from a number of non-diabetics was undertaken. This work was carried out in the summer of 1929 but the presentation of the data was delayed with the hope of obtaining more cases for study. As it is, the group of cases studied is rather small and the paper is to be considered only as a preliminary report.

Experimental

General Procedure

For the most part the specimens studied were first photographed and then x-ray pictures were taken. In order to get an idea of the internal structure the stones were next cut in half and the surfaces carefully polished. Photographs of these sections were taken, followed by another x-ray picture. The stones were then finely powdered, dried to constant weight and portions taken for analysis.

Moisture

Most of the stones reported on in this study had been collected some time previous to the time the analyses were carried out. Many of the specimens had been exposed to the air during that period. Accordingly it was impossible to get any exact idea as to the percentage of water contained in the stones at the time of their removal from the gall bladder. For this reason the results of the analyses are open to some criticism since the water content of gall stones might vary considerably. In the analysis of a small group of stones Rosenbloom found a variation in water content from 0.5% to 47.0%. In all except three of the cases, however, the moisture content was between 0.5% and 8.0%. Peel made chemical analyses of a large number of gall stones but apparently took no consideration of the water content. All his results are given on the basis of the dry material. Discussing certain chemical changes associated with gall stones Fowweather and Collinson disregarded the original moisture content of the material since after washing the stones and drying with filter paper they were preserved in cotton wool to be analyzed when convenient.

The percentage of water in the stones as they come from the gall bladder has been determined in a few of the specimens of this group and will be determined in the analyses which will be reported at a later date. While the failure to determine the water content of the stones examined would naturally make a difference in the absolute percentage of cholesterol and calcium present, the ratio of the cholesterol to calcium content would remain unchanged when calculated on the dry basis.

Cholesterol

Cholesterol determinations were made colorimetrically making use of the Lieherman-Burchard reaction. The technique as given by Bloor, Pelkan and Allen was followed. Samples of the powdered stones were extracted in a Soxhlet extraction apparatus for 24 hours with an alcohol-ether mixture 3:1. The extract was made to a definite volume and aliquots taken for the determinations.

Calcium

The determinations of calcium were made according to the method of Fiske and Logan. The details of the procedure were kindly given by Dr. Logan before the method was published. Direct ashing of the powdered stones containing a large amount of cholesterol is quite difficult. Accordingly a weighed sample of the powder was taken in a large test tube and treated with ether. The ether solution of the cholesterol was filtered through an ashless filter paper. The filter paper and residue were returned to the test tube and the whole ashed with H_2SO_4 and HNO_3 till colorless and then made up to a definite volume. Aliquots of 4 to 5 cc. containing from .2 to .6 mg. of calcium and less than the equivalent of 1 cc. of 10 normal H_2SO_4 were taken for the determination. 4 cc. of 2.5% oxalic acid solution were added followed by NH_4OH until a pH of 5 was reached. After shaking for 2 to 3 minutes the tubes were allowed to stand overnight. The calcium oxalate was then filtered in the special filtration tube, washed with ammonium oxalate, transferred to a platinum crucible,

dried, ignited and the Ca0 titrated with .02 normal acid and base.

X-Ray Analysis

In addition to the chemical analysis of the calculi an x-ray analysis was undertaken with the idea of easily obtaining information as to the relative amount of calcium present and also for purposes of classification of the stones.

The x-ray procedure for the study of the classification and composition of gall stones offers distinct advantages over the section method. The objection to the section method is that it is very tedious and by it one cannot tell whether the section of one stone is representative of a large group of stones. Such objections are eliminated by use of the x-ray method. The crystalline form and color are lacking in the x-ray pictures but certain chemical constituents are more distinctly brought out, namely calcium in inorganic and organic combination. Likewise information as to the formation of calculi can often be obtained from the x-ray pictures.

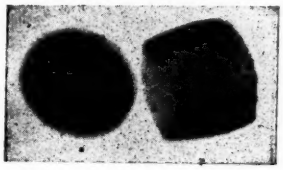
According to Sattler the possibility of the x-ray procedure for the systematic study of the classification and composition of gall stones was first pointed out by Aschoff in 1926. In a paper soon after that, 1927, Löffler discussed the method and described single examples of x-ray pictures of the Aschoff stone classification. In the next year Bauer and Habs advanced a systematic classification of gall stones on the basis of their x-ray analysis and presented a series of seven types with x-ray differences. These groups are: (1) x-rays with a completely homogeneous structure (pure cholesterol stones and pure calcium bilirubin stones); (2) x-rays with concentric structure (yearly ring type); (3) x-rays with a pronounced radial structure (likely the cholesterol-calcium-pigment stones); (4) x-rays with a honeycomb structure (barrel form); (5) x-rays with intensive shadows (pure pigmented stones, calcium carbonate stones); (6) x-rays of combination stones (3 groups); (7) x-rays of conglomeration stones (not very frequent—one with six faceted concentive cholesterol-calcium-pigment stones all with a mantle of earthy pigment).

Methods for the preparation of the x-ray pictures and for the preparation of sections and microphotographs are given by Bauer and Habs in the same article. Later Habs made a comparative study between section preparations and x-rays of gall stones.

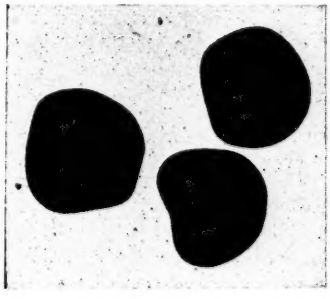
Saint-Laurens has written a dissertation on the relation between the opacity of gall stones to x-rays and their chemical composition. It is pointed out that while calcium is the chief element responsible for the shadows in gall stones other elements such as copper, iron, silicon, magnesium and manganese may contribute. Copper is of especial interest in view of its relation to the pathogenesis of biliary calculi.

The results of our work on the x-ray analysis when compared with the chemical analysis show definitely the ease of the identification of calcium in the stones. However to hope to adapt such a method to a quantitative estimation of calcium hardly seems practicable. The results also confirm the opinion of the excellency of the x-ray procedure for a study of the classification of biliary calculi. The pictures of a few representative groups are shown below.

With but a few minor variations the technique employed in making the x-ray plates consisted of 50 kilovolts and 10 milliamperes for an interval of 2 seconds at a distance of 30 inches.

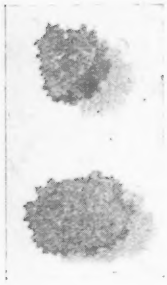


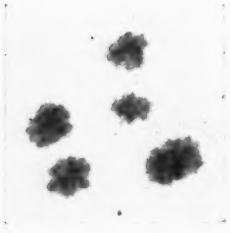
NO. 31
Times 1 1/2
Cholesterol—Calcium—Pigment
Radial Structure
Cholesterol = 85.2%
Calcium = .780%



NO. 17
Times 1 3/10
Cholesterol—Calcium—Pigment
Cholesterol = 52.8%
Calcium = 14.7%

NO. 18
Times 1 3/5
Cholesterol—Calcium—Pigment
Honeycomb Structure
Cholesterol = 41.0%
Calcium = 29.4%

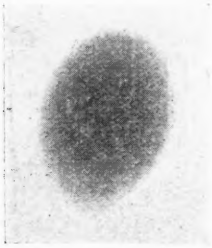




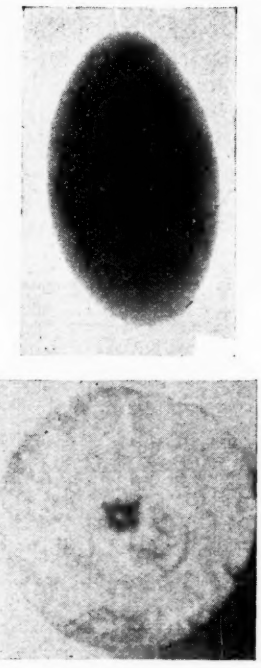
NO. 20
Times 1 3/5
Calcium—Pigment—(Mulberry)
Intensive Homogeneous Shadow
Cholesterol = 0.0%
Calcium = 34.6%

NO. 36
Times 1 1/3
Combination Stone

Cholesterol	Center = 83.8%	Mantle = 65.5%
Calcium	Center = 0.0%	Mantle = 3.19%

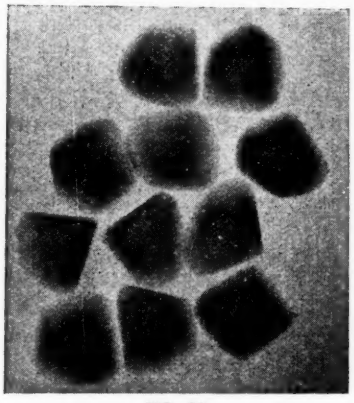


NO. 22
Times 1 2/5
Cholesterol Solitaire
Homogeneous Structure
Cholesterol = 95.7%
Calcium = 0.0%

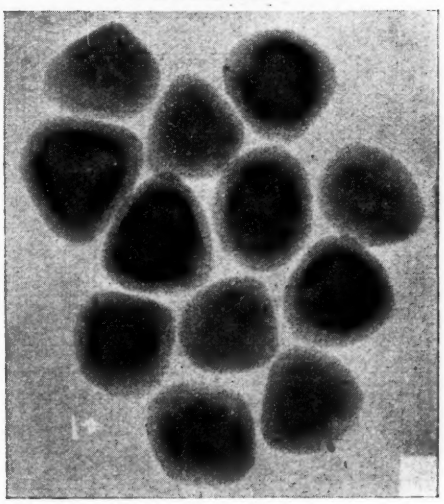


NO. 4
Times 1 1/2
Cholesterol Solitaire
Incomplete Homogeneous Structure

Cholesterol	Entire Stone = 97.7%	Nucleus = 63.4%
Calcium	Entire Stone = trace	Nucleus = 4.45%



NO. 30
Times 1 1/2
Cholesterol—Pigment (Faceted)
Homogeneous Structure
Cholesterol = 87.3%
Calcium = 0.0%



NO. 8
Times 1 3/5
Cholesterol—Calcium—Pigment (Faceted)
Concentric Structure
Cholesterol = 93.3%
Calcium = 1.23%

The results of the chemical analysis of the calculi from the diabetic group and from the non-diabetic group are presented in tabular form in the following two tables. Additional information as to the condition of the gall bladder, history of previous infectious diseases, relation of the time of onset of diabetes to the time of the onset of cholelithiasis, and any other complications as tabulated in each case. The figures for the cholesterol and calcium determinations are calculated on the dry basis.

Discussion

From the results of the chemical analysis in these two groups of gall stones there is no clear cut evidence that the stones from the diabetics are notably higher in cholesterol content than the stones from the control non-diabetics. There are a few more groups of stones containing over 90% cholesterol in the diabetic group than in the non-diabetic group but certainly too few to state that gall stones from diabetics contain a higher percentage of cholesterol.

Fowweather and Collinson failed to observe

any association between particular types of stones and any special change in the blood or gall bladder. Gross on the other hand has found that besides there being an association between gall stones and obesity, cholecystitis, cancer of gall bladder, arterial atheroma, chronic nephritis and xanthoma, there is a direct association between gall stones and diabetes. He maintains that since there is an increased cholesterol in the blood in diabetes it is reasonable to suppose that the hypercholesterolemia might be associated with an increased incidence of gall stones in this disease. His figures show a definite association between both the faceted and the solitary cholesterol stones. The data presented by Gross are as follows:

	4652 Control Cases	Op. with Stones	82 Diabetics No. with Stones	% with Stones
Gall stones all types	726	15.6	21	25.7
Solitary cholesterol stones	115	2.5	9	11.0
Faceted stones	134	2.8	8	9.7
Pigment stones	53	1.1	3	3.6
Mulberry stones	27	.6	1	1.2

No chemical analyses were presented.

In our control group there are actually more cholesterol solitaires than in the non-diabetic group. Of course the control group is very small compared with Gross's figures and it may be that by chance more cholesterol solitaires occurred in this small series.

Rosenbloom in his study of the chemical composition of gall stones, states that in every case with a previous history of an infection, the gall stones were chemically composed of calcium salts, while in those cases without a previous infection the gall stones were composed of cholesterol.

The cases presented here, however, do not exactly point to such a theory of the infectious origin of only the non-cholesterol type of stones. Several calculi rich in cholesterol have been found in cases with a history of previous infection. It is interesting to observe, though, that in cases Nos. 19 and 20 in which there is a previous history of infectious disease the percentage of cholesterol in the stones is very low or zero. Assuming an infectious origin of

Table 1 - Diabetic Group

No.	Sex	Age	Calculi Removed At	Date	Calculi					Gall Bladder	Previous History of Infection	Dates of Onset-Diabetes and Cholelithiasis	Remarks
					No.	Class.	Total Wt. Gm.	Per Cent Chol.	Per Cent. Cal.				
1	F	46	Operation	Nov. 1926	2	(Faceted) Chol.Pig. ?	3.47	99.8	0.0	Chronic Catarrhal Cholecystitis		Diab. Oct.1926 Chol. Nov.1926	Obese
2	M	58	Operation	Jan. 1926	Many	Chol.Pig.		98.9	0.0	Acute and Chronic Cholecystitis	Typhoid, Scarlet Fever	Diab. June 1922 Chol. Jan. 1926	Obese Arterio-sclerosis
3	F	61	Operation	July 1926	2			97.8	0.0	Chronic Cholecystitis	Pneumonia	Diab. June 1925 Chol. June 1925	Nephritis
4	F	57	Operation	July 1929	1	Chol.Solitaire ?	10.2	97.7	trace				
5	F	66	Operation	Mar. 1928				95.0	0.0	(not removed)		Diab. Jan. 1929 Chol. Mar. 1928	Obese
6	F	56	Operation	Mar. 1926	8	Pure Chol.		94.6	0.0	Chronic Cholecystitis		Diab. Feb. 1926 Chol. 1911 Recurrent 1926	Obese
7	F	47	Operation	Dec. 1925	35±	Pure Chol.	3.44	94.1	0.0			Diab. 1921 Chol. 1925	Obese
8	F	60	Autopsy	Oct. 1927	12	(Faceted) Chol.Cal. Pig.	17.0	93.3	1.23	Pathological		Diab. 1922 Chol. 1926	Obese Arterio-sclerosis
9	F	44	Operation	Oct. 1928	5	Chol.Pig.	0.215	92.0	0.0	Subacute and Chronic Chol.		Diab. 1919 Chol. 1928	
10	F	61	Operation	Nov. 1928	7	(Faceted) Chol.Cal. Pig.	4.34	91.5	0.091			Diab.July 1921 Chol.Nov. 1928	Obese
11	F	69	Autopsy	Mar. 1928	27	(Faceted) Chol.Cal. Pig.	8.09	88.6	2.06			Diab. 1926 Chol.	Arterio-sclerosis
12	F	51	Operation		36±	Chol.Cal. Pig.	7.46	88.6	2.06	(not removed)		Diab. 1924 Chol. 1921	Obese
13	M	72	Autopsy	June 1929	63±	Chol.Cal. Pig.	2.12	85.4	1.63		Tuberculosis, Diph., Typhoid	Diab.about 1900	Obese Nephritis Arterio-sclerosis
14	F	66	Autopsy	Mar. 1928	1			80.4	0.903			Diab. 1912 Chol. 1928	Obese Arterio-sclerosis
15	F	52	Operation	Mar. 1929	1	Chol. $CaCO_3$?	1.44	79.2	4.31	Chronic Cholecystitis	Pneumonia,Diph. Influenza	Diab. 1927 Chol. 1929	
16	F			Apr. 1929	2	Combination	14.19	72.3	3.39	Chronic Cholecystitis		Diab. 1926 Chol. 1928 No evidence of Diab. 1929	
17	F	56	Autopsy	June 1929	3	(Faceted) Chol.Cal. Pig.	7.36	52.8	14.7			Diab. 1919 Chol. 1929	Obese
18	F	50	Operation	Jan. 1928	1	Chol.Pig. $CaCO_3$?	1.50	41.0	20.4	Cholecystitis		Diab. 1910 Chol. 1905	Obese
19	F	54	Operation	Nov. 1926	1	Chol. $CaCO_3$	.353	34.1	1.82	Stone from common duct	Diph.	Diab. 1921 Chol. ? 1906	Obese
20	F	60	Autopsy	Mar. 1929	5	Cal.Pig.	.970	0.0	34.6		Pneu. - Scarlet Fever	Diab. 1918 Chol.Autopsy	Obese Arterio-sclerosis

such stones these low cholesterol calculi might be ruled out from a possible relationship to diabetes.

It is difficult to draw any conclusions as to the type of stones formed from a study of the relationship of the onset of diabetes mellitus and cholelithiasis as it is impossible to know the exact time of the onset of gall stone formation. In fact the gall stones may remain in the gall bladder for several years without any symptoms becoming manifest. The histories show that in most of the cases the diagnosis of diabetes mellitus was made before that of cholelithiasis. Of the three cases in which the cholelithiasis preceded the diabetes the stones from two of them were of low cholesterol content. In the group in which the diabetes preceded the cholelithiasis the stones from two cases were also of low cholesterol content but in both cases the stones were removed at autopsy and their formation may possibly have been before the onset of diabetes. In this latter group the stones from seven of the twelve cases were of very high cholesterol content. This fact might lend support to the idea that gall stones occurring after the onset of diabetes mellitus are of metabolic origin and contain a high percentage of cholesterol.

On the whole, though, the results so far obtained do not definitely point to the theory that the gall stones from patients with diabetes mellitus have a higher percentage of cholesterol than the stones from a control non-diabetic group of patients. When a larger number of cases have been examined, perhaps some definite conclusion on the point can be drawn.

Table 2—Non-Diabetic Group

No.	Sex	Age	Calculi Removed At	Date	Calculi					Gall Bladder	Previous History of Infection	Remarks
					No.	Class.	Total Wt. Gm.	Per Cent. Chol.	Per Cent. Cal.			
21					1	Chol. Solitaire	10.7	96.4	0.0			
22	F	63	Operation	Feb. 1928	1	Chol. Solitaire	4.1	95.7	0.0	Cholecystitis	Scarlet Fever	
23	M	48		Aug. 1929	1	Chol. Solitaire	1.37	95.2 +	0.0	Cholecystitis	Pneumonia	Obese
24	F	60	Operation	Aug. 1929	10	(Facetted) Chol. Pigment	1.34	94.5 *	0.0	Subacute Cholecystitis		
25					1	Chol. Solitaire	6.0	94.0	0.0			
26	F	68	Operation	Apr. 1929	5	Chol. Pigment	.925	90.6	0.0	Chronic Cholecystitis		Obese
27	M	50	Operation	Mar. 1928	9	Chol. Cal.Pig.	1.16	89.2	1.23	Acute and Chronic Cholecystitis		Arteriosclerosis
28	F	63	Operation	Jan. 1929	12	(Facetted) Chol.Cal. Pig.	3.08	88.8	.827	Cholecystitis		
29	F	49	Operation	May 1929	212	(Facetted)	9.33	88.0	1.56	Chronic Cholecystitis		
30	F	55	Operation	May 1929	11	(Facetted) Chol.Pig.	8.64	87.3	0.0	Cholecystitis	Tuberculosis-Pneumonia	
31	M			Mar. 1929	2	Chol.Cal. Pig. ?	4.99	85.2	0.78	Subacute & Chronic Cholecystitis	Typhoid	
32					8	Chol.Cal. Pig.	3.45	84.9	0.388			
33	F	52	Autopsy	Sept. 1926	1	Chol.Cal. Pig.	11.03	81.0	3.91			Stone between Common Duct and Fundus of Gall Bladder
34	F	54	Operation	Feb. 1929	1	Chol.Cal. Pig.		80.9	5.91	Subacute & Chronic Cholecystitis	Typhoid	
35	F	58	Operation	Apr. 1929	2	Chol. $CaCO_3$?	1.64	71.6	11.2	Chronic Cholecystitis		
36	F	51	Operation	Mar. 1928	1	Combina-	29.7	67.5	2.84	Cholecystitis		Obese

* H_2O = 16.12% Cholesterol = 81.8% + H_2O = 7.02% Cholesterol = 88.3%

SUMMARY

1. The possible relationship between diabetes mellitus and cholelithiasis is discussed.

2. Data on the chemical analysis of cholesterol and calcium in the calculi from a group of diabetic and a group of non-diabetic patients are presented.

3. The results, while showing a slightly greater number of high percentage cholesterol stones from the diabetic group are too few to draw any definite conclusions on the theory that the calculi from diabetic patients are of a higher cholesterol content than those from non-diabetics.

4. X-ray analyses of the gall stones were made and the advantages of such a procedure for the detection of calcium and for the purpose of classification are pointed out.

It is with the utmost pleasure that we acknowledge the ever helpful inspiration and guidance of Dr. E. P.

Joslin. We greatly appreciate the aid of Dr. Shields Warren and Miss R. I. Parsons for making the many photographs and wish to express our indebtedness to Dr. Isabel K. Bogan for taking the x-ray pictures and to Dr. M. A. Logan for assistance in the calcium determinations.

This work was made possible by a grant from the Chemical Foundation.

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A RADIO MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

Growth and Development*

HAROLD C. STUART, M.D.

The Committee on Growth and Development of the White House Conference was asked to review the great mass of information relating to the characteristics, needs, and health of growing children, and to present that which may be accepted as proved and useful knowledge. It was also asked to indicate wherein our knowledge is inadequate and what should be done to fill the important gaps. The four volumes which constitute the official report of this Committee should justify the efforts expended in their compilation. They are the result of the most complete and critical study of the growth of children ever undertaken. Because of the very nature of the subject, however, much of the material contained in these reports deals with fundamental scientific problems upon the solution of which our practices in the care of child health must depend. We need not linger with these problems, but will turn to the conclusions which have

(Continued on page 257)

*Broadcast: May 31, 1932. Station: WBZ—Hotel Bradford. Time: 4:20 P.M.

PREVENTABLE CHILD DEATHS*

Acute Appendicitis

BY HENRY W. HUDSON, JR., M.D.†

IT is gratifying to observe a steady decrease in deaths in childhood (Figure 1) but disheartening to note that certain preventable deaths are not decreasing and, in fact, may be increasing.

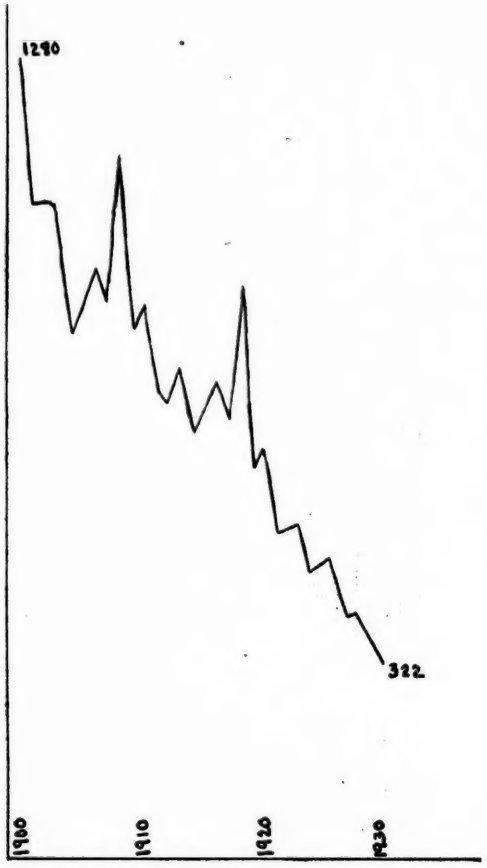

FIGURE 1. Deaths per 100,000. All causes. Ages 1-10 years. Massachusetts 1900-1930.

The second figure indicates the ten most common causes of death in the age group from one to ten years in Massachusetts in the years 1926 to 1930 inclusive. It is my purpose to point out the importance of appendicitis as a cause of death and to maintain the thesis that these deaths are preventable in a large measure.

In Massachusetts from 1900-1930 inclusive, appendicitis was recorded as the cause of the death of 1795 children. In 1900 the diagnosis was recorded twenty-five times and in 1930 one hundred and seven times. This represents an increase of 428 per cent in a period in which the child population increased only 41 per cent. During these years the death-rate in this age group increased from 5.2 to 15.8 per 100,000 child population (Figure 3). In this time appendicitis increased as a factor in all deaths in this age group from 0.5 per cent to 3 per cent and, in 1930 alone, to 4.9 per cent! The progressive rise by five-year periods is evident in Figure 4.

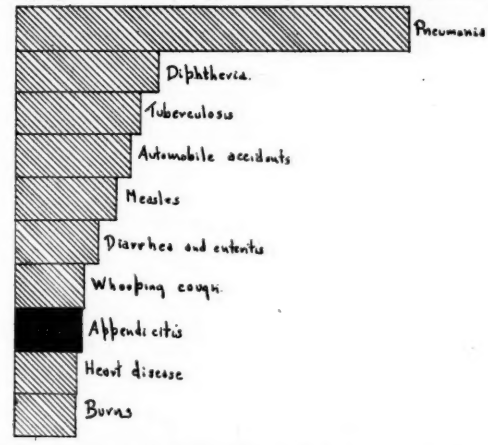

FIGURE 2. Ten most common causes of death. Ages 1-9 years inclusive. Massachusetts 1926-1930.

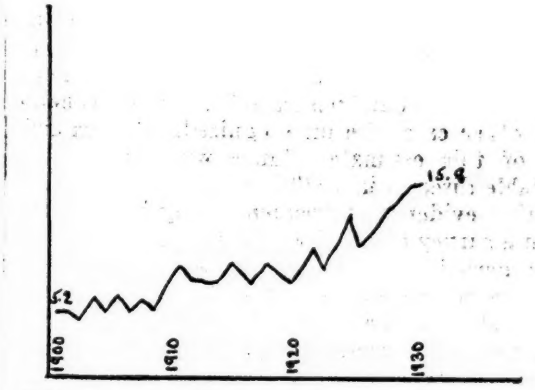

FIGURE 3. Appendicitis. Deaths per 100,000. Ages 1-10 years. Massachusetts 1900-1930.

It may be said that the increase is more apparent than real and that it simply represents improved accuracy in diagnoses recorded on death certificates. Marsh[1] suggests this and points out the decreasing peritonitis death-rate as the appendicitis death-rate increases. During the past year, comments on the rising appendicitis mortality rate have appeared from various points of the United States and Wilkie[2] has discussed the increase in England. Editorial comment[3] has appeared recently in this *Journal*.

*The statistics from which the figures were prepared were obtained through the courtesy of the Massachusetts Department of Public Health.

†Hudson—Assistant Surgeon, Boston Children's Hospital and Cambridge Hospital. For record and address of author see "This Week's Issue," page 282.

Whether the increase is due in part or entirely to increased clinical recognition of an important cause of death does not lessen the desirability of reducing the number of child deaths from appendicitis.

It is possible to estimate the frequency of the disease in several ways. If 5.8 per cent, the gross mortality rate from appendicitis in

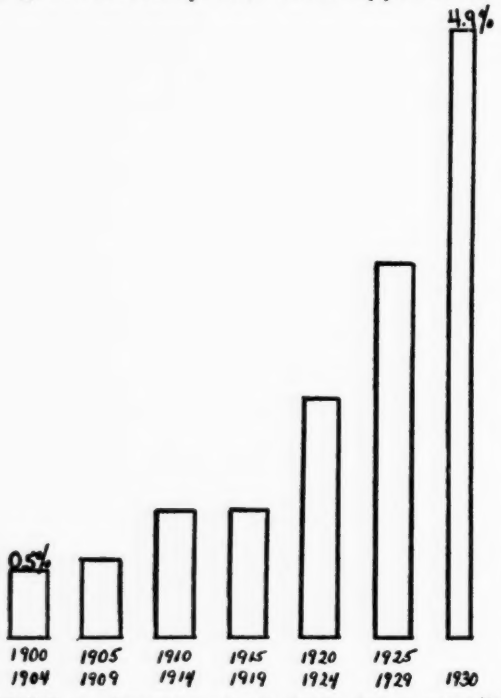

FIGURE 4. Percentage of all deaths due to appendicitis. Ages 1-10 years. Five year periods 1900-1929. Massachusetts.

1378 cases from the Boston Children's Hospital, be accepted as a fair average it would appear that there were 1870 cases of appendicitis among Massachusetts children in 1930. It is probable that other cases die unrecognized. A comparison of this estimated figure with certain reportable diseases in 1930 is made in Figure 5.

Other evidence of frequency may be obtained from a survey of hospital diagnoses. In the ten-year period 1921-1930 there were 51,790 admissions to the wards of the Boston Children's Hospital and the diagnosis *Appendicitis* was recorded 1378 times, a frequency of one in thirty-seven admissions for all causes. If admission for tonsillectomy and for inguinal hernia be omitted, appendicitis is the most commonly recorded diagnosis.

It has been demonstrated without question that appendicitis is an important factor in child deaths and, by inference, it has been shown that appendicitis is a common disease. What measures, then, may be effective in saving these child lives? Since the disease is not preventable, our single defense is effective treatment. Treatment may be regarded as specific in a sense true of few diseases. With early diagnosis, the inflamed viscus may be safely removed with most gratifying results. On the other hand, late diagnosis means peritoneal complications and a rapidly rising mortality rate. Without complications the mortality is nil. In 106 uncomplicated cases there were no deaths but in the same period there were 94 complicated cases with twelve deaths. The contrast between no mortality and 12.6 per cent mortality needs no further comment.

It is pertinent to inquire into the time when surgical interference is sought in this community. On January 10, 1930, Dr. George D. Cutler reported his personal experience* in 300 cases from the surgical service of the Boston Children's Hospital. Drainage was considered necessary in 238 or 79.3 per cent! More recently (1929-1930-1931) in 71 emergency operations at the Boston Children's Hospital and Woolson Building of the Cambridge Hospital, I have instituted drainage in 42 or 59.1 per cent. Evidently there has been some improvement in seeking surgical relief but, in the cases as they are

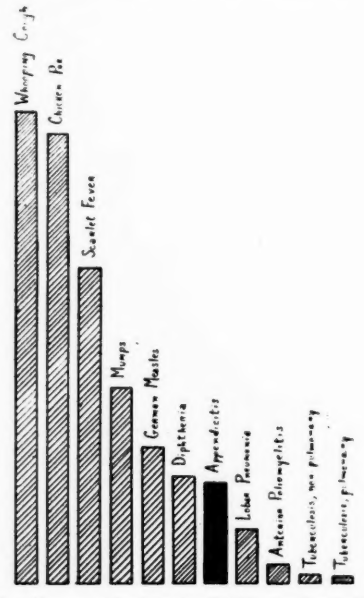

FIGURE 5. Frequency of appendicitis (estimated) compared with certain reportable diseases. Ages 1-9 years inclusive. Massachusetts 1930.

seen, early diagnosis is made in only 20 to 40 per cent of these children.

It will be generally accepted, I think, that if appendicectomy is to be done at all it is desirable that it be done as soon as possible. The group in which it is "too late for early operation and too early for late" is the one in which the mortalities occur. Although it is true that an acute appendicitis may subside and operation be avoided, it is never safe to assume this in childhood. The policy, sometimes successfully followed in adult surgery, of observing the patient at intervals to determine whether the inflammatory process is increasing or decreasing is folly in childhood. The progress of inflammation may be extremely rapid and the time lost between observations result in an avoidable

*Before the New England Pediatric Society. The privilege of including these statistics is gratefully acknowledged.

mortality. Perforation within six to eight hours of the first symptom is not rare. The principle of early operation does not seem to be appreciated as the percentage of patients coming to late operation bears tragic witness.

Responsibility for early diagnosis can rest with only three individuals—the child patient, his parent, and his physician.

It is possible, but improbable, that the combination of a stoic child and an unobserving parent might result in delayed recognition of illness. Little can be done to lessen this possibility.

The responsibility of the parent is to obtain competent medical attendance on his sick child. In most instances this is left undone until home remedies have been tried and have failed. Parents are often surprised when informed that a child has appendicitis and frequently state that they did not know the condition occurred in childhood. It would appear that public instruction is as necessary in this subject as it is in arthritis, contraception, heart disease, infant feeding, pregnancy, tuberculosis and urology.

An insurance company has recently made use of advertising space to call public attention to appendicitis in childhood. The Radio Health Messages sponsored by the Massachusetts Medical Society and the Massachusetts Department of Public Health afford one effective medium for the education of parents. Physicians requested to address lay groups on medical subjects might accomplish a great deal by considering appendicitis in childhood.

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A RADIO MESSAGE

(Continued from page 254)

more practical interests for those who care for children.

First, a word as to the way children grow: Growth and development are continuous and orderly processes starting at conception, progressing rapidly during pregnancy and infancy, and more slowly throughout childhood. Growth and development continue until about the twentieth year with a notable acceleration of rate during adolescence. This general course of events, as well as many of the details of its accomplishment, is very predictable and common to all normal children. But children differ greatly in their individual rates of growth and in their characteristics at different ages. What is normal or desirable for one child may not be satisfactory for another of the same age. Although all follow a similar general curve, individuals grow irregularly, often in rapid spurts followed by rest, and their requirements must, of necessity, vary from time to time with these changes. Furthermore, every child is limited by his inherited physical and mental equipment, and we cannot improve on these by an overabundance of care. No two children, with the exception of identical twins, are born with the same capacity for growth or with the same endowment. We know of no stimulant which will increase the rate of growth; and even if we did, we have no evidence that larger is synonymous with better when it comes to size of babies or children. It should not be the purpose of parents, teachers, or physicians to have all children grow alike; but rather to see children grow to the fullest extent of their individual capacity without limitations imposed by preventable causes. For these reasons our plans and procedures for protecting the health of growing children should be built upon the following principles:

(1) Protection should start directly after conception and continue uninterruptedly through the period of adolescence.
(2) We should be very certain that what we aim to accomplish is really desirable.
(3) We should have good reasons to believe that the procedures we adopt are likely to accomplish the ends we desire.
(4) These procedures should be based upon the findings at periodic health examinations, and on a thorough knowledge of the individual child for whom they are intended.
(5) They should be quickly changed if the individual's reactions to them show such needs.

What are the conditions which interfere with growth?

(1) Some defect in the structure or function of the body.
(2) Faulty diet.
(3) Unsuitable environment, either physical or mental.
(4) Some infectious disease.

What can be done to prevent these? The defects, as a group, offer us the least opportunity, for they represent damage already done. Many of them are due to causes occurring before birth and concerning which we know very little indeed. We should recognize these defects promptly in order that those which can be corrected may receive such treatment at the appropriate time; and that for children who must retain a handicap, suitable adjustments shall be made.

The prevention of unsatisfactory growth due to faulty diet is an entirely different matter. Here we have our greatest opportunity for success. A complete and adequate diet is essential for normal growth. By complete we mean that it contains every one of the thirty-five food elements which science has demonstrated are essential. By adequate we refer to amounts of each of these and the number of calories necessary to meet the individual child's needs at the moment. These are determined by his age, his rate of growth, his activity, and

(Continued on page 262)

OBSERVATIONS ON PENTOBARBITAL-SODIUM IN LUMBAR PUNCTURES, CONVULSIVE AND MANIC STATES*

BY SAMUEL H. EPSTEIN, M.D.,† AND FRANK W. MARVIN, M.D.†

THE recent literature contains many reports concerning the use of the derivatives of barbituric acid as anesthetic and sedative agents. The purpose of this communication is to present the results of our experience with sodium ethylmethylbutyl barbiturate (pentobarbital-sodium), employed in various conditions requiring sedation. This drug is about twice as toxic as sodium isoamylethyl barbiturate (amytal) and its action is much shorter. Lundy[1] states that it causes delirium and restlessness less often than other barbiturates.

We have administered pentobarbital-sodium as a sedative in various conditions. In the first place, it was used to facilitate the performance of lumbar punctures in psychotic patients, thereby overcoming resistivity. It was also used in various types of excited and disturbed patients, particularly of the manic-depressive group, and in the management of the convulsive states. In addition various physiological observations were made after intravenous administration of the drug, with especial reference to its effect on intracranial pressure and systemic blood pressure.

A total of fifty patients representing routine admissions to the Boston Psychopathic Hospital were given pentobarbital-sodium by mouth from 1½ to 2½ hours prior to the performance of the lumbar puncture. A constant dosage of 0.2 gm. was used. Good coöperation was obtained in all the cases, allowing the puncture to be easily done. In every instance the resistance of the patient was greatly diminished and fear was invariably allayed. The pain usually associated with the needle puncture was practically absent in 70% of the cases without the use of a local anesthetic. Marked somnolence was noted in over 90% of the cases. This persisted as a rule throughout the day, allowing the patient unusual comfort following the lumbar puncture.

Those patients who were extremely excited and resistive could not be punctured in this way. In these cases complete narcosis was necessary. This was obtained by the intravenous injection of 0.3 to 0.5 gm. of pentobarbital-sodium dissolved in 10 to 15 c.c. of distilled water. The patients were usually in a state of narcosis by the time the injection had been completed, and the lumbar puncture could be done without difficulty. This was especially significant to us because in our experience it was not uncommon to fail to complete a routine spinal puncture due to lack of coöperation or because of resistance on the part of the psychotic patient. In twenty instances, the intravenous use of pentobarbital-sodium obviated this difficulty. Three of these patients were young children, in whom one is tempted to use a general anesthetic, such as ether, because of the undesirable effects of mental trauma associated with overcoming resistance by force.

Intravenous administration of pentobarbital-sodium was also found useful in cases of manic excitement, controlling the overactivity and affording rest. Many patients of this type do not respond satisfactorily to the usual sedatives, such as paraldehyde, scopolamine, luminal, amytal, etc. In a number of instances, pentobarbital-sodium controlled the situation where the other drugs had failed. Invariably after one injection of 0.4 to 0.5 gm. of pentobarbital-sodium, the patients slept soundly for several hours and remained in bed in a drowsy state for the greater part of a whole day. In a few cases the drug was administered repeatedly on successive days, and no untoward effects were noted. As Lundy[1] has pointed out, pentobarbital-sodium is easily eliminated and has no apparent cumulative action.

The following case report is illustrative of the effect of the drug in this type of patient. A 36 year old woman showed marked restlessness and excitement associated with chronic myocarditis and auricular fibrillation. Morphine was pushed to the reasonable limit both subcutaneously and intravenously without sedative effect. In fact, on several occasions the excitement was increased after the morphine. Other sedatives, namely, paraldehyde, bromides, luminal, sodium luminal, dial, and veronal, were also used over a period of six weeks. With the exception of sodium luminal given intravenously, all these drugs had remarkably little effect in producing sedation. After the intravenous injection of 0.4 gm. of pentobarbital-sodium the patient slept for five and one half hours, which was the longest period of rest she had throughout her course in the hospital.

In the convulsive states, pentobarbital-sodium was found to be of distinct value. Oral administration of 0.2 gm. reduced the frequency of attacks in several epileptic patients who were having three to five attacks per day. In cases of status epilepticus, intravenous administration of this drug was usually effective in stopping the convulsions. This method was employed in many instances with excellent results. One patient who had been having ten to twenty attacks per day for a week in spite of frequent intravenous injections of sodium luminal subsequently went into status. The intravenous

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injection of 0.3 gm. of pentobarbital-sodium brought about complete cessation of attacks and produced prolonged sleep. Another epileptic who was admitted to the hospital in status had forty-two seizures within ten hours. After a single injection of 0.3 gm. of pentobarbital-sodium the seizures ceased and the patient slept eight hours. The next day the patient was quiet and mentally alert and free from seizures.

Following the intravenous administration of pentobarbital-sodium we noted certain physiological effects. Twenty-five patients were studied from this point of view. In nearly every case an initial drop of blood pressure occurred. The systolic drop consisted of 20 to 30 millimeters, and the range of diastolic drop was 10 to 30 millimeters. The lowest point was usually reached within 20 to 40 minutes, and the original blood pressure was restored as a rule in 60 to 90 minutes after the administration of the drug. In an occasional patient the blood pressure did not return to the original level until two hours had elapsed. There were no untoward effects resulting from the drop of blood pressure, and no emergency occurred which necessitated the use of adrenalin. Chart I shows the curve of blood pressure changes in a typical case.

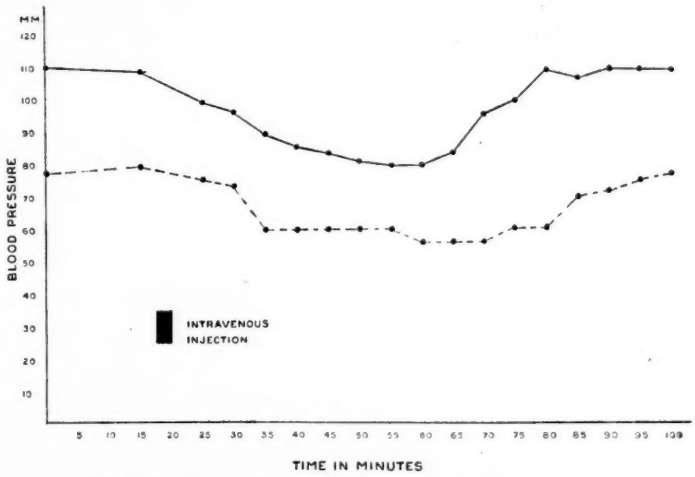

CHART I. Effect of pentobarbital-sodium on blood pressure.

Repeated observations on the spinal fluid pressure were also made. For this purpose a group of coöperative patients were punctured without the use of a sedative, and spinal fluid pressure readings were made with a water manometer. With the lumbar puncture needle in place, pentobarbital-sodium was given intravenously, and pressure readings were taken throughout the period of narcosis. In some cases there was a rise of 10 to 20 millimeters of water and in others a decrease of 10 to 15 millimeters. This was not constant, however, and was not considered as significant, since such slight changes could easily be attributed to changes in position and tension of the patient. This was pointed out by Solomon[2] several years ago in making prolonged observations on spinal fluid pressures in various positions.

The effect of pentobarbital-sodium on the pulse and respiration was studied. No change in the pulse rate was noted, and the quality and volume of the pulse appeared to be good throughout the period of narcosis. Immediately after the injection of the drug the respirations became shallow and slow, and as the respiratory center was stimulated by the resulting accumulation of carbon dioxide, the breathing became more rapid. Within a few minutes, however, the respirations returned to normal and continued without change throughout the narcosis.

As already mentioned, there is a profound effect on the central nervous system. As the drug is being injected the patient becomes drowsy, fails to answer questions, and is in a state of narcosis by the time the injection is completed. As the dose is increased the skin reflex to pain is gradually abolished and the gag reflex disappears. The narcosis varies from three to four hours. The patient is often drowsy for a few hours after the return of consciousness but responds readily. There is usually no memory of events occurring after the beginning of the injection, and there is no excitement either at the beginning or the end of the narcosis.

SUMMARY

1. Pentobarbital-sodium is an efficient and safe sedative and produces a profound narcosis when given intravenously.
2. It provides a method of overcoming resistivity and obtaining coöperation in the performance of lumbar punctures in psychotic patients.
3. It is of value in controlling convulsions in epilepsy and overactivity in manic states.
4. After intravenous administration, there is a transient drop in blood pressure, but no change in the spinal fluid pressure.

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MASSACHUSETTS MEDICO-LEGAL SOCIETY

ANTHRAX, AN INDUSTRIAL HAZARD*

Report on the Surgical Treatment of Malignant Pustule

BY S. CHASE TUCKER, M.D.†

ANTHRAX, usually described as a rare disease in man, occurs frequently in Peabody, Massachusetts, the world's largest leather city. As a practicing physician and surgeon for many years, numerous cases have come to my attention. For this reason I have been asked to tell you of the methods and results obtained through the plan of treatment we have been following.

As you know, anthrax is an acute, frequently fatal disease caused by B. anthracis and is contracted from animal products or animals, chiefly cattle, sheep and horses. It was one of the first diseases to be traced to a microörganism and was described by Pollender[1] in 1849. Davaine[2] demonstrated the etiological significance of the bacterium in 1863 and Koch[3] and Pasteur[4], observing that it was a spore bearer, cultivated it outside the body and reproduced the disease in animals by inoculating them with the cultures.

It is a rod-shaped, square-ended bacillus, gram-positive in its staining, forming long threads in which the spores develop, giving the effect of a string of beads. The spores are highly resistant and have been known to retain their virulence for years in infected ground. The anthrax bacilli can be attenuated by a long-continued temperature of 42 degrees (F.), and cultures of them injected into a herd will render it immune. They can be killed by boiling for four minutes; killing of the spores requires hours.

There are several forms of the infection,—the cutaneous or malignant pustule, the pulmonary or wool-sorters' disease, an anthrax septicemia, and occasionally an enteritis. In Peabody the cutaneous lesion is the only type which we meet, and the heads of our leather plants instruct all employees as to its danger and to report the slightest eruption or itching on the face, neck, hands or arms.

The malignant pustule, so-called, although it is neither pus-forming nor malignant, first manifests itself as a small pimple, with a sense of itching. Incubation requires from one to three days when a small vesicle forms, containing sanguineous fluid, and this rapidly develops into a gangrenous eschar. There is almost no pain or tenderness, but a smear prepared from the vesicle will reveal the typical organisms.

The spread into the general circulation is usually very slow although death has been known to occur within twenty-four hours of the first manifestation. The infection becomes general by formation of a primary necrosis and thrombosis of the lymph and vascular systems; the organisms grow in these clots and further necroses take place until a general septicemia has developed. The constitutional symptoms are those of any ordinary infection, influenzal in character. The mortality is variously stated by authorities to be from 15-26%. Of the last thirty-six cases we have had covering a period of a few years, this not being a disease of great prevalence, the deaths have been as follows: two patients who were moribund when brought in and no treatment was given; two for whom operative procedures were not undertaken until general sepsis had taken place, and one of whom I could not procure a complete history. Our mortality thus is considerably below the average.

Our experience is approximately as follows: The patient presents himself at some one of the doctors' offices, introduced by some member of the factory staff who has become suspicious of a slight papule resembling a flea bite, that itches, upon the patient's face or arms. Perhaps the foreman is alert, due to the fact that he knows that the hides in the process of cure come from an area that is never free from anthrax, such as Russia or China. Occasionally a patient with a fully-developed vesicle, resembling a vaccination of smallpox, is brought in. These patients are admitted to the hospital without delay, for surgical treatment. The operation consists of removing a "button" large enough to include all indurated tissue, and cutting through the entire skin into the subcutaneous fat. We have found from studying many bacterial cultures that the bacteria penetrate toward the deep, rather than into the surrounding superficial tissues. I have removed large and small areas, but of late have depended upon the depth rather than the width of the "button". If this operation is performed at the very onset, the patient will often have no further trouble. If this is not done soon enough, very grave symptoms develop rapidly.

All lesions are immediately examined by smear preparations as well as by culture for the bacteria.

The gravity of the infection depends somewhat upon its location. I find that the neck and the vicinity about the eye prove to be the most serious. The treatment that has been found most

*Read at the winter meeting of the Massachusetts Medico-Legal Society, February 3, 1932.

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satisfactory to me subsequent to the operation is the constant changing of pads wet in 1-5000 bichloride of mercury. By this I mean that about every 15 minutes an ordinary gauze sponge is wet in the solution and placed in the wound. This is continued night and day until all signs of infection disappear. A special nurse is required, as no nurse is allowed to travel from an anthrax-infected patient to any other sick person.

Usually there is considerable edema, at times so severe as to render the features unrecognizable, and often the neck becomes as large as the head. It is not uncommon to find the chest wall quite edematous. When the lesion is on the arm, it resembles any active cellulitis.

We have used in some instances the anti-anthrax serum intravenously, but have seen very little difference between the behavior of the infections for which we used the serum and those for which we did not use it. In some very severe infections we have resorted to 1% mercurochrome which is obtained specially prepared in glass ampules, giving 35-50 c.c. intravenously. This seems to be of more value than anything else we have employed. The temperature is very slight in the early stages, but as the infection progresses it rises frequently to 104°-105°, even reaching 106° with the general symptoms of heart exhaustion. Such conditions are treated symptomatically.

Case I. W. K., male, white, aged 38, whose family and personal histories were negative except that he was a periodic hard drinker, first noticed a pustule above the left eye on November 17. He saw his doctor on November 18 and was admitted to the hospital for immediate operation. His heart, lungs and urine were negative. At about the middle of and slightly above the left eyebrow, there was a spot approximately ½ inch in diameter, depressed in the center, dark in color and surrounded by minute vesicles; the whole area was slightly swollen. There was no pain but he complained of a stinging, itching feeling. There was almost no edema of the upper eyelid. The temperature was 99°; the pulse 80. A smear from the spot was made and found to contain B. anthracis. This was confirmed at the Tufts College Medical School. He was admitted to the hospital at 11:30 A. M. and at 1:00 P. M. the above area was excised through all the subcutaneous tissue, about 6/8 inch in diameter, including all of the indurated portion. This was done under general anesthesia. Wet packs of bichloride of mercury 1-10000 were changed every 15 minutes; argyrol was placed in the eye three times a day. He was given liquid food and the intake of water was forced.

November 19. There was some swelling about the eye and forehead extending into the cheek. The patient was still able to open this eye but began to suffer a little discomfort. The temperature was 101°; pulse 72.

November 20. The edema increased, extending down into the face and left side of the head. Temperature 103.6°; pulse, 100. Anthrax serum was given. As the toxemia seemed to be increasing, mercurochrome, 1% solution, was also given, intravenously, and a drop in the temperature and pulse followed a few hours later. In all, the contents of five ampules of anti-anthrax serum were introduced on this day.

November 21. The edema still increased. The left side of the neck and head became swollen and the eye on this side was closed. The temperature was 104°; the pulse 100. A second injection of mercurochrome was followed by a reduction in temperature to 101.6°.

November 22. The patient was very uncomfortable. The edema had increased, extending to all of the head, neck and chest. He complained of severe pain in his head and neck and was weak. He had pain in his chest on respiration and raised considerable phlegm. He was given hydriodic acid, drams one, every two hours. The left eyelids were discolored and apparently sloughing. The patient was very ill and restless with nausea and vomiting, and was delirious. The pulse was of poor quality, the rate 100. At 11:30 A. M., 45 c.c. of 1% solution of mercurochrome were given; he had a slight chill about an hour later, after which he perspired freely and seemed quieter.

November 23. The temperature dropped to 101.4° and the pulse to 72 early in the morning. In the evening the pulse was 100; the temperature 103°. The slough about both eyelids was quite apparent.

November 24. Mercurochrome was used in place of argyrol. Temperature 100.4°, pulse 80. Recovery, except for sloughing, gradually taking place; edema decreasing.

November 28. A head rest was given and on December 9 a chair and blanket were allowed. A large slough began to separate on both upper and lower lids. This gradually came away, leaving a large part of the upper and lower lids destroyed; even the orbicularis oculi muscles, and granulation appeared with considerable retraction. He was discharged from the hospital on January 4.

February 3. The eye is now completely closed so far as his ability to open it is concerned, although it can be opened manually. There is some purulent discharge at the present time, but the margins of both lids seem to have remained intact through the entire sloughing period. A plastic operation will be done later to restore his ability to open and close the eye, if it is possible to do so.

Case II. B. M. Was admitted to the hospital April 22, 1931, with an anthrax pustule on his face.

The family and personal histories were negative except for children's diseases and varicose veins. He noticed a pustule at the angle of the jaw four days before admission, which spot continued to enlarge until it had reached the size of a twenty-five cent piece. As it was painless, he had applied various ointments. He complained of no chills, fever or toxic symptoms, although he had considerable edema over the left jaw, face and neck. Physical examination showed his head to be negative except for edema of entire left side of face, and down along his neck. A pustule the size of a twenty-five cent piece, seen at the angle of this jaw, was elevated, non-tender, and surrounded by marked edema and redness. There was a hernia in the right inguinal region. The temperature was 100.6°, the pulse 118, respirations 24. The laboratory report of a smear preparation made before the operation was positive for B. anthracis.

The operation consisted of making an elliptical incision around the pustule, including healthy tissue, and removal by undermining. The temperature was normal a few hours after the operation. Bichloride dressings, 1-5000, were applied every half hour. Fluids were forced and 50 c.c. of anti-anthrax serum given at night, intravenously.

April 23. The patient was in good condition. Fifty c.c. of anti-anthrax serum were given. Culture taken from the base of pustule bed showed round bodies thought to be spore forms. The urine was negative except for a few granular casts.

April 24. Patient was in good condition. Temperature, pulse and respiration normal. Culture showed no growth. Bichloride dressings were applied every 2 hours. The patient continued to convalesce uneventfully and was discharged May 4, 1931.

CASE III. R. J., a wool worker, aged 49, whose family and personal histories were negative, noticed, on November 1, 1924, a sore red place near his right eye. Three days later the whole right side of his face was swollen and the eye closed. November 4 he entered the hospital.

The physical examination was negative except for edema of the right side of the face and eye, and a small pustule about 1/4 inch in diameter near the inner canthus. The urine was negative. A smear preparation from the pustule was negative but the culture showed typical anthrax bacilli. The temperature was 99.4°, the pulse 106, the respirations 28.

Operation on the same day consisted of excision of the pustule. A bichloride sponge, 1-5000 was applied constantly.

November 5. The patient's condition was poor, the pulse being 140. Argyrol was applied to both eyes and the bichloride sponges continued.

November 6. The swelling of the face had increased. The temperature was 105°, the pulse 140, the respirations 28. Fifty c.c. of anti-anthrax serum were injected and sponge baths were given. He continued to grow weaker and 15 c.c. of 1% mercurochrome were given intravenously. The urine showed a slight trace of albumin.

November 7. The condition remained poor. Temperature was 105.2°, respirations 34, pulse 142. Anti-anthrax serum, 60 c.c., were given in the morning, and 40 c.c. in the afternoon. Digitalis and strychnine were administered.

November 8. The patient was very weak. We increased the strychnine and gave Spt. Frumenti. Temperature 102°, pulse 138, respirations 28. The urine showed a trace of albumin. The swelling around the right eye was decreasing.

November 9. Condition was improved. Temperature 100°, pulse 100, respirations 28.

November 10. Improving; the swelling of the face and neck decreasing.

Patient continued to improve. There was a discharge from the right eye, but the vision was not impaired.

November 24. There was less swelling about the infected eye, although there was considerable slough.

November 27. Slough was gone from both upper and lower lids, which were granulating.

December 1. Bichloride sponges were omitted. Zinc oxide applied to upper and lower lids.

December 10. Patient discharged.

I very much appreciate your courtesy in asking me to tell you about this industrial hazard, so rarely met with in other communities, and I will be very glad to explain any points that I may not have made clear.

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A RADIO MESSAGE

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other such factors. An inadequate supply of any one of the food essentials will lead to some sort of deficiency disease. The first principle, therefore, in planning for the adequate nutrition of our children is to make certain that their diets contain all of the necessary food substances in ample amounts. It is relatively easy to plan a diet, for children of different ages, which contains all of these fundamental ingredients. Milk, for example, is rich in many of them. Fruit, green vegetables and the cereals are valuable additions. An adequate diet is not necessarily an expensive diet. It is rather an intelligently planned one. Some thought must be given to the child's appetite and his attitude toward the taking of food. A great number of American children are offered ample amounts and varieties of food, but fail to take them because of faulty training and often because of too much fussing about what they will and will not eat. Wise dietary advice does not consist in forcing all children of a given age to adopt a standard menu, but rather in giving suggestions for improvement after a careful study of the individual child and his habits of eating.

Time will not permit our considering the various problems of environment and their relations to the growth of the child. Sunlight, temperature, cleanliness, opportunity for sleep, exercise, and play; these and many others have a direct bearing on a child's growth. Physical health is also dependent upon the early establishment of good habits, upon suitable training, and reasonable opportunity to learn. Evidence is accumulating that the mental development of a child may be encouraged and accelerated to a very material degree by the application of sound methods of education; and we know that physical and mental development are very closely interdependent.

Let us now consider the prevention of infectious diseases: The effects of infection on growth and development, although hard to measure, are, nevertheless, clearly recognized. Most infections temporarily interfere with growth. During convalescence there is a tendency for growth to be accelerated to compensate for this delay. When growth is rapid the need for food, sleep, rest, and all the requirements is naturally increased. Adequate health protection calls for special care during these convalescent periods. The more chronic infectious diseases, as well as those which tend to recur, are more likely to interfere permanently with the growth of the child. We should do our best to avoid the occurrence of infectious disease of any kind and take the necessary steps to see that preventable diseases never occur. It is a reflection upon the intelligence of any parent to have his child develop diphtheria, because this is an easily preventable disease. We should try to postpone those infectious diseases which during the early years of rapid growth are more serious than they are later. Whooping cough and measles are common examples. They rarely cause death or serious damage to the school child but in infancy and very early

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MASSACHUSETTS TUBERCULOSIS LEAGUE

THE THREE-YEAR HEALTH EDUCATION STUDY IN THE LYNN ENGLISH HIGH SCHOOL*

BY ERNEST STEPHENS, A.B.†

PUBLIC education today is facing one of the gravest crises in its history. A depression unprecedented in its severity is rapidly forcing cities and towns to a point where, when the cost of welfare work is met, not enough money remains to meet the demands which society, during almost a decade of profligate spending, has come to consider necessary and essential. It is a period when stocks and bonds, "bears" and bandits, prohibition and bonus legislation, kidnapping and lawlessness fill the pages of our newspapers and magazines. The heroic work of teachers and social workers in keeping up child morale, in staving off grim want and need, in saving this good land of ours, which no longer "flows with milk and honey," so that it may be a fit place in which to live and rear our children, will never be fully appreciated. We are rapidly approaching a time when in the field of public education there will be a curtailment of services, a retrenchment of vital work, which will strangle and wipe out the progress made during the last fifteen to twenty years. I do not want to paint an alarmist's view of the situation, but it is time facts were faced and counsel taken if we would save the vantage points gained during more favorable times, and be ready to launch out on a vigorous health program when more auspicious days are with us again.

In 1918 Bulletin No. 35 of the Department of the Interior entitled "Cardinal Principles of the Secondary Education" came from the press. Among other things we find the following statements:

"Health needs cannot be neglected during the period of secondary education without serious danger to the individual and the race. The secondary school should, therefore, provide health instruction, inculcate health habits, organize an effective program of physical activities, regard health needs in planning work and play, and coöperate with home and community in safeguarding and promoting health interests.

"To carry out such a program it is necessary to arouse the public to recognize that the health needs of young people are of vital importance to society, to secure teachers competent to ascertain and meet the needs of individual pupils and able to inculcate in the entire student body a love for clean sport, to furnish adequate equipment for physical activities, and to make the school building, its rooms and surroundings, conform to the best standards of hygiene and sanitation."

That was fourteen years ago and we have not yet approximated the standards set up by that committee. In fact, with very few exceptions an adequate program of health education for secondary schools does not exist. More than that there is no agreement as to what constitutes such a program.

For purposes of this paper the program which I will discuss is that which we have been working on in Lynn, aided and encouraged by the State Department of Public Health, the Massachusetts Tuberculosis League, Professor Clair E. Turner of the Massachusetts Institute of Technology, and many others.

We became interested in the problem three years ago as a natural development in our program of curriculum reconstruction. We had been working on the reorganization of the physical education courses and the health curriculum in the elementary schools. This field had been very successfully pioneered in other communities. But nothing much had been done in the secondary schools. Feeling that Lynn had an administrative and supervisory set-up which would lend itself to the development of a secondary program, the Massachusetts Tuberculosis League offered to help by sponsoring a study in the senior high schools. This organization with the coöperation of the State Department of Public Health has done valiant service in exploring the needs, in instituting a careful study of conditions, in organizing and developing a program of work looking toward the establishment of an adequate health curriculum, based on efficient medical service.

Plans could not have been more carefully laid, and yet it has been found over and over again that fundamental changes have had to be made. Miss Jean Latimer, Educational Secretary of the League, has actively directed the progress of this study, outlining its scope, arranging the necessary conferences, following through the multitude of details. Her wide and successful experience has made it possible to point the way over many difficult situations. She has placed us in touch with specialists in the field of health education who have given us needed direction. Not merely as a coördinator has her leadership been valuable, but more intimately as a co-worker, counsellor and constructive critic.

Through every phase of the study Dr. M.

*Read at the Annual Meeting of the Massachusetts Tuberculosis League, April 28, 1932.

†Stephens—Deputy Superintendent in charge of Secondary Education, Lynn, Mass. For record and address of author see "This Week's Issue," page 282.

Luise Diez, Director of Child Health of the State Department of Health, has shown her interest in developing a sane program of health education in the secondary schools of the State. She has given unstintingly of her time in many conferences. Her advice and suggestions have been most sincerely appreciated and have been of inestimable value in our program. Other members of the State staff will be particularly mentioned in the published report of the Lynn study.

We had boys and girls physically examined by the hundred; social and school histories were taken and checked; x-rays were taken of about five hundred pupils; home visits were made by visiting teachers and trained nutritionists; health councils have been created to do consultant and follow-up work, and to initiate "safe and sane" school programs for those boys and girls needing special attention; a course of study for senior high school pupils is being developed.

We discovered early that we must choose one of two paths in working out this problem. We could definitely say to ourselves: "A lot of time and money have been put into this study; let's capitalize on the situation, cash in as it were on our efforts, and put out something showy which could be pointed to with pride and demonstrate to the wide world that Lynn was doing something very worth while in health education." The other path was more difficult, filled with obstacles and discouragements, meaning weeks and months of patient study and weighing of results, developing nothing showy or spectacular, but furnishing rather substantial conclusions both as to procedures and subject matter fields. We chose the latter path. An outsider coming to Lynn looking for the evidence of three years' work would leave disappointed and skeptical.*

Yet we feel that we are developing a program for Lynn which will be found effective and will endure, at the same time furnishing a guide to other localities. Working as we are in the field of social research, it is impossible in the short span of three years to determine techniques and obtain conclusive evidence in the form of statistics. It takes time, skill, and patience to develop a course of study, and to build up a program of work.

We have found that the habit training in the elementary grades does form desirable and lasting habits. It is painfully apparent that boys and girls of high school age lack accurate information which is the basis for healthy and satisfactory living. The simplest principles of nutrition are yet to be known and practiced. Necessity for an annual physical examination to search out handicaps and needs was demonstrated as urgent and vital. It is not enough to find out what is wrong, but for an increasingly large number of young people the way to correct deficiencies must be pointed out, encouragement given to have things righted, and follow-up provided to see that desirable results are attained.

For a health program to be worth the name it must be built on a sympathetic, forward-looking, adequate medical service. Such a service contemplates annual physical examinations by competent physicians; more frequent examinations as needed; daily inspections by nurses and sometimes doctors for the purpose of preventing and controlling communicable diseases; proper immunization; dental supervision; recourse to specialists and the clinics when such specialized service is needed.

Facilities should be available to every school department for meeting special problems arising from emotional disturbances. Pupils must learn the importance of mental health, of facing reality, of seeing things in their true perspective, shorn of exaggerations. Pupils must learn to master themselves.*†

In the construction of our course in Lynn we have been exceedingly fortunate in having Miss Ellen Lytle, sent by the League, with us. Her excellent training, teaching experience, and tact have been of inestimable value in building an acceptable morale, in finding available materials, and in trying out and testing subject matter content. She has made a notable contribution in coördinating the widely divergent interests of faculty members into an effective, workable health council.

We are tentatively considering a course made up of three general units—one in physiology and personal hygiene, one on nutrition, and the third on community health and public sanitation.

These will be published subsequently by the League after other tryouts under the editorship of Miss Latimer, its Educational Secretary. She brings to this task training in the secondary field, an unusually wide acquaintance with high school methods and procedures, and an absorbing interest in the developments made by the progressive educationists.

Competent and adequate medical service is fundamental to any health program. It is be-

* "The function of the school medical service is not to make diagnoses or to give treatment, but to assist the school in its work of education, and to refer to parents and family physicians children with remediable defects. In this connection the coöperative help of the school nurse and the visiting teacher in influencing parents to have the remedial work attended to is extremely important."—*Report of the White House Conference.*

* "An extra curricular social program should furnish opportunity for learning habits of social adjustment through healthful outside activities. A type of discipline should obtain that respects the personality of the individual and helps him to recognize his own conflicting desires, and to substitute socially valuable behavior for those of his wishes which are ethically or aesthetically undesirable."—*Report of the White House Conference.*

† "Pupils leaving high school should have knowledge of the structure and function of the human body, the biology of reproduction, knowledge and skills which will enable them to coöperate in the reduction of accidents, knowledge and skill in first aid, knowledge of the effects of tobacco, alcohol and other narcotics, and patent medicines upon the individual human organism, and on society; freedom from superstition on subjects concerning health and disease, respect for the scientific method as it applies to health, and a specific knowledge of their own assets and liabilities in bodily development."—*Report of the White House Conference.*

coming accepted that in the high school there is need of a course which will give boys and girls accurate information about themselves as an aid to wholesome living. There is the further need of a coördinating group made up of a cross section of the faculty working under the chairmanship of a health counselor, whose functions it will be

a. To create interest in the school health work by securing active coöperation of the faculty and students.
b. To centralize the organization and administration of the school health program.
c. To determine all available resources in the school that could contribute to a well-developed health education program.
d. To coördinate these resources so that they may be used in the most effective manner, thus making it possible for each department to function in a broader way.
e. To act as a clearing house for all school and community health problems.

This health council might be composed of the school physician, the nurse, the health teacher, a physical education teacher for boys and one for girls, an English teacher, the girls' adviser, the school psychologist, a home economics teacher, a social studies teacher, a mathematics teacher, a science teacher, an art teacher, a vocations teacher, a lunch room director, and a janitor. Of course, such a council could be created only in a large, well-organized school. A similar council composed of fewer members and a less varied personnel could be formed in a smaller school to meet the same needs.

Such a council can definitely determine the methods necessary and best for reaching boys and girls who have special problems. These may require special physical examinations, follow-up work to secure correction of remedial defects, suggestions for underweight pupils, attention for those suffering from ill health, nervous strain, low mental ability, bad habits of disposition, and difficult home conditions. This council representing as it does a cross section of opinion can render invaluable service in determining what bodies of information should be included in a health curriculum. This group can mould faculty opinion, disseminate a point of view which will develop on the part of the principal, teachers and pupils a positive health consciousness. Through the media of student organizations, the school paper, assembly programs and the like, definite objectives can be attained.

It is highly desirable that the individual who heads the council be a full-time worker who has had special training in public health and public contacts. It would be ideal if this person had had successful teaching experience and was a registered nurse. Care should be taken that the nurse who has been trained in bedside care only shall have gained the positive health point of view. Youngsters in school are normal healthy boys and girls. If they are not, they should be trained to rise to these standards and be aided by the school in that progress.

Some of you may raise the question, "How can we do all these things and hire specially trained workers when in my community less and less money is available, and there is already talk of eliminating certain special services, like medical service, nurses, etc.?" This point is well taken.

It is right here that the Lynn study is going to be of value to other communities. We haven't had the adequate medical service of which I have spoken in my suggestions, nor have we been able to have a full-time, specially trained health counsellor. But we have had a live, wide-awake health council made up of a cross section of the faculty working under a principal who appreciates the problems. We are developing a health course which started last year as a tryout with one section of twenty-two pupils. This year there are two divisions. There could have been four had we been ready to handle them. We have placed this program in the science department where I think it belongs. This work could profitably be divided so that boys and girls would come in separate sections—the boys with men science teachers, the girls with home economics teachers. This division would be particularly advantageous in the unit devoted to personal hygiene. Teachers trained for either type of position can readily fit themselves to do the health work. Substitute this course for one of the other science courses. Make the content and the presentation worth doing this. Until the colleges allow the health course for admission, count it as a course in hygiene which they will credit.

While this program in Lynn is only a partial program, it is progress in the right direction, the courses offered cost not a penny more than equivalent courses in science, but does set up definite objectives which can be attained in any school system by any group of trained people who have the will to be of service.

*"The fundamentals of our curricula are not necessarily the oldest in the curricula, and the dropping of subjects on the basis of recency, sometimes under the name of fads and frills, frequently removes from the schools subjects that are really most fundamental to the real success of public education."

It is entirely possible that much of the work, including health work, which has crept into our secondary school programs in the last few years, and which some unthinking and generally unfriendly individuals label fads and frills, is vital and fundamental. It is not this type of

*Massachusetts Superintendents' Resolutions, Bridgewater, 1932.

work which should be curtailed or eliminated in a program of retrenchment. Rather if some things must go, let us accept the challenge and remove some of the traditional requirements of our program, leaving first things first in point of emphasis.

WHAT CONTRIBUTION MAY THE LOCAL HEALTH ORGANIZATION RENDER A JUNIOR HIGH SCHOOL IN DEVELOPING A HEALTH EDUCATION PROGRAM?*

BY IVAN G. SMITH, A.B.†

THE schoolmaster of today never accepts an educational policy which does not grow from one of the seven cardinal principles of education, the first of which is "health". Therefore, while I can claim no renown for my knowledge of health facts, the challenge of the health and happiness of some 2,300 boys and girls under my charge makes the problem of health education a pertinent one.

The little tots pour into our first grades from homes of all degrees of intellectual background, from the mother of the low moron type to one who is a college graduate. It becomes the duty of the teacher to educate through long, patient hours these little folks to the ways of right living, in body and mind, by example and by instruction. By developing the right habits and the right attitudes these little folks will learn.

The "why's" of health need not so much enter into the work of the elementary schools, but as the child advances in age, the knowledge of the "why's" of health behavior must be explained and the emphasis on habits gradually enlarged to include those based on intelligent knowledge.

For several years there had been presented a course in our junior high school, required in grades seven and eight, in "Health Habits," founded upon texts of recognized authority, with a rather generous weekly time allowance. Possibly in recognition of this and because of my affiliation with the Essex County Health Association, the offer was made to supply a full-time health instructor who would work under the direction of the association and the Massachusetts Tuberculosis League.

Miss Rae E. Kaufer was assigned to the classwork by the association and her work has been aided by the very able supervision of Miss Jean Latimer, Educational Secretary of the League. Our own classroom teachers have observed the work very intimately and since the first of February have conducted classes under the guidance and supervision of Miss Kaufer and Miss Latimer, so that the experimental work which has been organized during the past term may be carried on and improved year by year. May I present briefly the more intimate details of the work at the Richmond Junior High School at Danvers as now organized, to give due credit to Miss Kaufer and to the four teachers who have worked with her—Miss Doherty, Miss Knight, Mrs. Richards and Miss Sweeney, and especially to Mr. Pitman, the principal, through whose whole-hearted coöperation this experiment has been made possible.

The objective for this program is to develop and to maintain to the optimal level the health of the individual pupil. Recognizing the mental development of the pupils of the seventh and eighth grades, the presentation of material has been on a factual basis of sufficient advancement to add to the previous health knowledge yet not to exceed their limitations.

The health work in the Richmond School may be classified under these headings (1) Health Protection, (2) Health Instruction and, (3) Health Development. While each heading thus presented adapts itself to classroom instruction, in no case is the objective accomplished without a careful correlation with the other subjects of the curriculum and the substantial backing of the teaching staff as a whole, the school nurse, the school physician, the school dentist (if there is such), the faculty health council, the student health council, the board of health, and last, but not least, a sympathetic school committee.

The school doctor and school nurse are required by law. If the law requires that all children between the ages of seven and fourteen must attend school five hours each day, if physically and mentally able, and if health is the first cardinal principle of education, then the challenge stands that the schools must maintain healthful conditions in all those places where the children must spend their time under the school supervision. Such a policy entails a study of school building, hygiene and a definite program to prevent and control communicable diseases, but closely allied to such a program may rightly be considered the detection of physical defects for the purpose of notifying the home and through it, bringing about corrections of remediable conditions. May I emphasize at this point the great importance of the coöperation of the home, for without it, health progress is greatly retarded.

This program demands (1) at least a thorough physical examination yearly and more frequent examinations of those found having defects, (2) the examination of the eyes and ears,

*Read at the Annual Meeting of the Massachusetts Tuberculosis League, April 28, 1932.

†Smith—Superintendent of Schools, Danvers, Mass. For record and address of author see "This Week's Issue," page 282.

(3) dental examinations, (4) posture and foot examinations and (5) in retarded and problem children a careful mental examination. While the specialists should be available for this work, but little can be accomplished without the constant follow-up work of the nurse and the daily inspections by the nurse, the teachers and often the pupils themselves.

As a further step in the prevention of communicable disease, the State law requires vaccination. Danvers has a very enviable record in the prevention of diphtheria through the use of the Schick test and the toxin-antitoxin treatment. The use of the tuberculin test is another step forward to combat the effect of still another devastating disease, and a remarkable work is being carried on through the efforts of the Chadwick Clinic.

My paper so far does not consider the instructional side except incidentally; to this phase of the health program in the schools I wish now to turn—Health Instruction. The outstanding objectives may well be stated as follows:

1. To develop right attitudes and high ideals toward health and health practices in life situations.
2. To give students information which will help them to improve and conserve their own health.
3. To aid in establishing specific health habits, and lastly,
4. To coöperate with parents and others in contributing to the health of the community.

The instruction in health education in grades seven and eight is the topic for special consideration, for it is upon this project that Miss Kaufer is now working in our junior high school. The units selected for the basis of the instruction are (1) Factors affecting normal growth, (2) Nutrition, (3) Community Health. While various other units could well have been organized, it was thought that under these three, all topics affecting health, could well be classified.

The first topic, factors affecting normal growth, was distinctly a study of "self". Emphasis was placed upon a study of one's own ability to grow and of how various influences advanced or retarded growth. Periodic weighing and height measuring with the plotting of graphs became immensely interesting to the children. The importance of a well-balanced diet, sound teeth, of work and rest, of cleanliness, of good posture upon bodily growth were carefully considered as well as the bad effects of tobacco and alcohol.

Under the study of nutrition, the following topics were discussed: (1) Reasons why the body needs food, (2) Classification of food materials, (3) Food needs of the various parts of the body, (4) Selection of food, (5) Digestion of food, (6) Eating habits in relation to digestion, (7) Absorption of food, (8) Elimination of food, (9) Practice in meal-planning and balancing of diets.

One of the most interesting experiments of the course was conducted in conjunction with this work, that of the feeding of four white rats, two on a balanced diet and two on an unbalanced diet. The charting of the growth weekly over an extended period proved beyond doubt the value of diet consideration.

The natural program from personal health is to community health, and all that that term includes. I feel that if every taxpayer could have taken this study he would be able to realize somewhat better where each dollar of taxes is spent and that he is getting full value for every dollar.

The activity of our Board of Health enters into almost every phase of our lives. It protects our food supply and our water supply; it regulates our sewage and garbage disposal; it guards us against communicable diseases, especially tuberculosis, and it coöperates with other social agencies, the schools and private organizations to make each town a better place in which to live.

At this point may I present one statement which I believe is very deserving of careful consideration. Government-controlled enterprises generally lack initiation due to the absence of competition whereas practically all great discoveries are made in the private laboratories. Just so in education many of the activities of the schools as the work of the school physician, the school nurse, the school dentist, the work in physical education, etc., were originally supported by private health organizations until the demand was created and the activity as organized was taken over by the public institutions and the offering became a regular part of the program. It seems to me that it is incumbent upon health organizations of this type to expend their energies in seeking out or experimenting in ways and means of combating the onrush of the dread disease of tuberculosis and when success is reached to make available to the public institutions, the findings and let them carry on.

The study of tuberculosis and its prevention covered a period of study of three weeks and seems most comprehensive in its content. The objectives of this study are first, to teach the cause, symptoms, methods of transmission and control, cure and prevention of tuberculosis, and secondly, to develop an appreciation of the efforts which have been made, and which are being made to eradicate tuberculosis.

Each of the six lessons assigned to this subject was used to develop a point in the objectives as just given. The method of approach was carefully decided upon and a detailed method of procedure was established.

Time will not permit my further presentation of the work in this course except that I

wish to read the outline for one day's lesson to show the detail used to carry on this work:

Lesson II

Tuberculosis and Its Prevention—Objectives

1. To review the symptoms and cause of tuberculosis.
2. To teach the method of transmission of the tubercle bacilli.
3. To teach the method of infection of tuberlosis.
4. To teach the types of tuberculosis.

Approach: Through an examination of the illustrations in the pamphlet "Hitch-hikers".

Procedure: (1) With the aid of the abovementioned illustrations a list of the principal methods of transmission of the tubercle bacilli was made:

Method of Transmission:
a. person to person.
b. animal to person.
c. animal to animal.
d. objects which have been infected by a or b.

It was noted that tuberculosis is not inherited.

(2) A report was made on "Testing Cattle for Tuberculosis."

(3) Units one and two of the film "Tuberculosis and How It May Be Avoided" were shown and the following questions upon it were asked:

(a) What is the name and shape of the bacillus which causes tuberculosis?
(b) Which part of the body is the principal place of infection?
(c) How does the body respond when these bacilli enter it?
(d) What test is used to show whether a person has been infected with these germs?
(e) How long does the doctor wait after giving this test before he looks at it again?
(f) What method is used to kill all bacteria?
(g) What other method may be used to see if the body has been infected with the bacilli of tuberculosis?

(4) A discussion was held regarding the way in which the body becomes infected with the tubercle bacilli:

(a) Primary infection—Childhood type.
(b) Advanced infection—Adult type.

Parts of the body which are affected:

(a) Lungs principally.
(b) Other parts of the body.

(5) The following reports were assigned:

(a) Can the body develop immunity against tuberculosis?
(b) Tuberculosis in children.

(References were given.)

Outcomes:

1. The symptoms and causes of tuberculosis were reviewed.
2. The method of transmission of the tubercle bacilli was learned.
3. The method of infection of tuberculosis.
4. The types of tuberculosis.

Thus through the year the course has been mapped out to present the facts of better health to the boys and girls of the seventh and eighth grades in order that, knowing these facts, they will guide their actions so that not only will their personal health be improved, but also that the health conditions of the community may be raised.

In closing I wish to leave with you this thought that the growth of a nation can be measured by the physical and mental health of its citizens, and that as the one or the other lags, so does the progress of the nation. It is then for each one of us to lend our strength to the oar, if you will, the oar of perfect physical and mental growth, that the ship of state may glide safely past the pitfalls which have wrecked other nations in the past.

A RADIO MESSAGE

(Continued from page 262)

childhood these diseases may be serious. All possible effort should be made to prevent the rapidly growing infant from coming in contact with individuals suffering from mild infection, such as the common cold, as well as more serious ones like tuberculosis.

Let us now consider how we may know whether our children are progressing satisfactorily and that nothing requires attention. For this purpose periodic health examinations become essential. It is difficult to differentiate normal and abnormal in the individual. It is still more difficult to distinguish between the best and less than the best. It is practically impossible, except in extreme instances, to make such distinction at a single examination without knowledge of the child's background. Much more information can be obtained when periodic examinations are made, as it is then possible to measure the child's progress as well as his status. The reports of the Committee on Growth and Development contain a great variety of information which enables the physician to interpret progress made between consecutive examinations. The x-ray, for example, may be used with great satisfaction in showing the quality of growth in bones as well as the condition of various organs. It often leads to the recognition of abnormality at a time when illness may most easily be prevented.

In conclusion the Committee on Growth and Development of the White House Conference presented ample evidence that many things which interfere with the normal growth of children can be avoided by intelligent effort. This effort must first be directed toward securing adequate information as to just what a child's needs are at any given time, and then toward providing these needs to the best of our ability.

MEDICAL PROGRESS

PROGRESS IN DIAGNOSIS AND TREATMENT OF SYPHILIS, 1930

BY AUSTIN W. CHEEVER, M.D.*

DURING the year 1930 there has been but little that is really new in regard to the problem of handling syphilis but there has been more or less improvement in our knowledge of useful drugs and how to utilize them. A good deal of attention has been paid recently to attempts to find out how much syphilis there really is in the country

From numerous surveys of rural and urban communities made recently by the United States Public Health Service and local public health and medical organizations, Parran and Usilton[1] estimate that there are about 643,000 cases of syphilis and 474,000 cases of gonorrhea constantly under medical care in the United States. He finds about 31 per cent of those known to be under treatment among the indigent, the peak age for the onset of both syphilis and gonorrhea is from twenty to twenty-five years. The incidence is higher among the colored than the white, the average being 11 per thousand; in the latter, the rating in one neighborhood was as high as 24 per thousand as compared with 8 per thousand among the whites. Six and nine-tenths per cent of women in maternity hospitals is the average from many sources for ten years. Four per cent of the inmates of our insane institutions are general paralytics and syphilis stands first or second among the most frequently reported infections to the public health service from the several state health departments. Gonorrhea stands fifth. About 21,000,000 days per annum are probably lost by the general adult male population from venereal diseases.

With these figures in mind a discussion of the status of syphilis today and a vision of its possible place tomorrow offered by Stokes[2] is opportune. Most fittingly he sums up the present situation thus:

"The syphilologist, working in his nether region among the fumes that inspire what Colonel Harrison has so aptly called the 'venereal disease nausea', looks up with wonder, and not without envy at times, at the light of public approval and interest glancing from the helms of public health legionaries as they march to the final conquest of minor plagues, such as diphtheria and typhoid fever. For the worker with the venereal diseases, there is no such glamour in the public eye. The reverberations of his figures are muffled in the hat of press censorship, bashed down over his ears. His elder brother, the tuberculosis worker, stalks by, a noble brow above a toga richly dyed with the royal purple of martyrs' blood and lighted by the spotlights of many a Christmas seal campaign. Syphilology is still in the overalls stage. Have you leaned over the rail of a liner at sea as the captain, flanked by his staff of chart-house aides, resplendent in gold braid, comes down the deck? And, leaning, have you seen the grimy head of a stoker pop through some scuttle just above the water line, to be followed by the 'spish-sh-sh-kerplop' of a torrent of ashes shot from a vent below him? You glimpse the status of syphilis and of the control of venereal disease in general in the contrast."

In discussing the controllability of syphilis in the public health sense, the author says that "one who would do the most immediate good in today's public health situation with respect to syphilis would spend his money and his energy studying and popularizing the utilization of things already abundantly available for relief from the situation." The salient issue for study and constructive action in modern public health syphilology is, the author feels, the problem of the individual practitioner versus the clinic. This issue is a peculiarly acute one for American practice for "if the United States under a practitioner's régime cannot demonstrate accomplishment equal to that of the more organized medical work of the European countries, it will be the duty, unwelcome perhaps, of prime movers for the cause of reform to urge organization as the remedy." The medical schools can help the situation not by increasing the hours of instruction in this subject for the undergraduate, but by an internal reform of teaching method, making the required work "an exercise in marksmanship and rule of thumb, with routine serologic testing in the foreground and with the fear of God and the spirochete and the need of consultation coloring the background."

In considering the various aspects of organization as an instrument of control, Stokes feels that the best type, if organization it must be, is the center or clinic devoted under combined medical, academic, and business auspices to practice, teaching, and research. In regard to the question of finance in clinics, he points to the effect of business genius in the organization of the Chicago Public Health Institute where the $50,000 capital investment has grown into buildings and laboratories ,collateral enterprises and research funds to the value of hundreds of thousands of dollars on such fees as one dollar for a blood test or for an injection of neoarsphenamine, and this in a state which does not provide

*Cheever—Visiting Dermatologist to the Beth Israel Hospital. For record and address of author see "This Week's Issue," page 282.

free arsphenamine. Successful medical follow-up and advertising will be utilized in the campaign of tomorrow. Research can assist this progress by finding a substitute for darkfield examination such as a specific differential staining or a serologic testing of the chancre serum, and the clarification of the clinical aspects of latency and the solution of the possibilities for prevention.

Norris[3] also has turned his attention toward the merits of the modern therapy and has reviewed the literature for expression of views. The statistical record of 149 cases of untreated and 43 inadequately treated patients is analyzed. The author found it difficult to draw conclusions further than that: untreated syphilis is still a serious malady and almost inevitably brings grave damage to visceral, vascular, and nervous systems. A comparison of the results in treated patients with those shown in this study appears to demonstrate that modern treatment with all its shortcomings is nevertheless of great value in the control of this disease. In discussing this paper Wile brought out the difficulties in the way of drawing conclusions of this sort: the radical and fundamental differences in methods of treatment, the variability in the estimation of the criteria of cure and such factors as duration of infection, age, presence of other diseases and even the social status of the patient, requiring great variation in therapeutic procedure. Personally, Wile thinks that modern syphilitic therapy has uncovered numbers of occult cases; that it is more protective and has brought about much better control of syphilis. It has been his experience that the vast majority of late accidents in syphilis occur among those patients who remain untreated or who receive inadequate treatment. Brunsting advanced the suggestion that in reviewing so-called untreated patients, one would search for such factors as pneumonia, typhoid fever, erysipelas, or malaria which may have had an innocent effect toward bolstering the resistance mechanism, thus bringing about a relative immunity in regard to the syphilitic infection.

RESEARCH

A new method of treatment being tried out in one of the state institutions in Massachusetts, published data on which is being awaited with interest, is that which uses electrical energy for the heating of patients with paresis. Carpenter and Boak[4], having discovered that an individual's body temperature became elevated when he was working in the field of a short wave transmitter, followed the suggestion of Whitney that this might be made valuable. They worked under a grant from the General Electric Company and an outfit was built suitable for heating rabbits by exposure to a field of 30-meter radio waves oscillating between two aluminum plates. Heat was given on the average of three times a week, raising the rectal temperature three to five degrees above normal. Of twenty-five rabbits inoculated and treated by this heat method, twenty-one failed to develop chancres though five of them developed testicular nodules which disappeared on intensifying the exposures. Eighteen of twenty control rabbits developed typical chancres, and the other two died of intercurrent disease.

Roskin and Levinson[5] found that exposure to ultraviolet rays increased the therapeutic and sterilizing action of arsphenamine in mice infected with spirochaeta Duttoni. They state that the effect of the radiation is not bound to any especial form of parasite.

Postpuncture headaches were studied by Nelson[6] who took readings of the pressure of the spinal fluid under varying circumstances, amount of fluid withdrawn, number of wounds made in dura, etc. Readings on 200 patients before and after removal of from 5 to 15 c.c. of spinal fluid showed no relation between pressures of spinal fluid or the circumstances mentioned and the incidence of headache. Readings of pressure were taken on three patients before and after removal of 8 c.c. of spinal fluid, and again the next day during typical postpuncture reactions and in all these cases the pressure was found to be remarkably low during the headache. In ten dogs, pieces of catgut were inserted at the lumbar puncture in the tracks left by the needle in the tissues. The catgut disappeared in from four to five weeks. There was no injury to the spinal cord or meninges. In 102 patients pieces of catgut 3 cm. long were inserted at lumbar puncture. Of this group of patients 4.9 per cent had typical postpuncture headaches; of the controls on whom ordinary spinal puncture was done 17.4 suffered reactions. It is believed that the catgut prevented headache by blocking the hole in the meninges after the puncture.

Hopkins[7] was led to record his observations on the types of associated complicating tertiary syphilitic lesions in manifest clinical neurosyphilis because of the paucity in literature of such studies. In 1371 cases reported, tertiary lesions occurred elsewhere than in the central nervous system in nearly 13 per cent. The most frequently observed complication was cardiovascular, which occurred in approximately 8 per cent, bone lesions were found in 5 per cent, cutaneous lesions in 2.4, and lesions of the mucous membrane in less than 1 per cent. Syphilis of the liver was the most common complicating visceral lesion.

In order to find out whether bismuth permeates the placenta, Pack, Scharnagel, and Veal[8] made tests on pregnant rabbits and cats, using fetal kidney changes as a proof of permeability. It was found that about sixty times the therapeutic dose for human beings, in other words,

a lethal dose for the pregnant animal, was required to produce these kidney changes.

A tendency in the literature in Germany and perhaps elsewhere in Europe indicates a feeling that early syphilis reacts less favorably to arsphenamine than before the War in the sense that relapses are more frequent and the blood reactions are not so rapidly turned to negative, but Moore and Robinson[9], studying this problem at Johns Hopkins Hospital, found no significant difference in the reactions in recent years as compared with earlier ones. They feel that true resistant syphilis is not increasing.

SEROLOGY

In 1921 a plan was made by the Health Committee of the League of Nations[10] for conducting comparative studies of modern serodiagnostic tests for syphilis. During 1922-1923 such tests were carried on in eight European state laboratories and reported on at a conference in Paris. To obviate some difficulties of agreement in these laboratories the Danish Serum Institute undertook to supply all material for testing by the various laboratories interested, but found that this coöperation was not wholly successful and an international conference of laboratory investigators was held at the Danish Serum Institute in November-December, 1923. Twelve different technics of the Wassermann, Meinecke, Sachs-Georgi, and Sigma tests were done and the conference concluded that the precipitation tests yielded enough positive results in syphilitic cases when the Wassermann was negative to justify their supplementary use. In 1928 a second Serologic Conference was held in Copenhagen and fifteen different methods were compared, each participant employing only one method. Ten were carried out by their authors. It was clearly shown that there has been a tremendous advance in specificity and sensitivity in the precipitation tests over the complement-fixation tests in the last few years. The Kahn and Muller clotting test entirely outclassed in sensitivity the Wassermann procedures, apparently without loss of specificity. The conference wisely endorsed the advice that more than one procedure be performed in all cases, preferably one complement-fixation and one precipitation test. America was represented by Kahn; unfortunately Kolmer was unable to be present. In 1929 the Committee of Experts under the auspices of the League of Nations met in Geneva to draw up a plan and form of inquiry into the treatment of syphilis, hoping that sufficient data might be compiled from all countries to form a basis for concepts in the treatment of syphilis. Membership of this committee included Rajchman, Director of the Health Committee, League of Nations; Rasch, Copenhagen; Madsen, Copenhagen (Serum Institute); Harrison, British Ministry of Health; Querat, French Society for Combating Venereal Disease; Stokes, United States Public Health Service; Jadassohn, Breslau, chairman. The committee has drawn up a case protocol and asked the coöperation of a number of clinics in the countries represented in the transfer of their case history records to this form. As many as one hundred clinics in this country and Europe are participating. The protocols will be studied by the Health Committee. In the United States the League investigation is being carried on with the coöperation of the United States Public Health Service and the Committee on Research in Syphilis, Inc. It is expected that this will be productive of important conclusions.

Favorable reports on the Hinton test have been made by Woodall[11] and by Austin[12]. The former applied the Wassermann, Kahn, and Hinton reactions to a large group of feeble-minded patients and found the Hinton to be twice as sensitive as the other tests. Austin feels that the Hinton compares favorably with the Kahn in syphilis and might be substituted for it, but not for a carefully standardized Wassermann technic.

PATHOLOGY

Wile, Wieder, and Warthin[13], after clinical and pathological study, described a case of malignant syphilis with large ulcerative lesions which on microscopic study differ from the usual pathology of syphilis in that they depended on circumscribed anemic infarctions of the corium and epidermis due to thrombosis of the cutaneous vessels secondary to syphilitic obliteration of medium-sized vessels at the border of the corium and subcutaneous tissue.

Greenbaum[14] finds that human gland transplants from patients with syphilis cannot be used as a means of determining cure since the spirochetes disappear spontaneously from these glands in many untreated and uncured cases.

TREATMENT

Bismarsen (bismuth arsphenamine sulphonate) was synthesized by Raiziss in 1925 and favorable reports on its experimental clinical use have been made by Stokes and Chambers, O'Leary, and Tobias. Kolmer[15] characterizes it as water-soluble, tissue-soluble, and rapidly absorbed from the muscles, the constitutional reactions being slight. However, he feels that it should be used with caution in persons who have previously had arsenical dermatitis or jaundice. He thinks it has a special usefulness in congenital syphilis, particularly for children to whom intravenous medication may be extremely difficult and in cases where Herxheimer reactions must be avoided. It has yielded encouraging results in the treatment of pulmonary spirochetosis and in severe cases of Vincent's angina. From a study of a group of patients

to whom over 5000 injections of this drug were given Shivers[16] feels that in early syphilis it is inferior to a course of neoarsphenamine followed by potassium bismuth tartrate, and advises if used at all, it should be only as a second course. It is, however, useful in early syphilis among old or debilitated persons in whom syphilis is complicated by other diseases. In late syphilis the author recommends bismarsen as more frequently the drug of choice in that reactions are fewer than from arsenic and bismuth given separately. The clinical and serologic effects have been very favorable. This is especially true in cerebrospinal syphilis of the acute meningeal type.

Reports on other drugs continue to appear. Grüneberg[17] has found the new thin-flowing "iodipin" which so far has been used mainly as a contrast medium in x-ray to be useful in late syphilis. It is an iodized fat produced by binding iodine and nonsaturated fatty acid, and is used subcutaneously. Cases of iodism from it are very rare. Levaditi[18] summarizes his experience of the last nine years in the employment of bismuth, stating the following principles: that it has curative action in all stages of syphilis; that it causes rapid disappearance of the treponema from early lesions; that it produces sterilization of the lymph glands; that it modifies favorably the blood and cerebrospinal fluid reactions; that it is relatively innocuous; that it has higher therapeutic value than mercury. Of all the forms in which bismuth is put up, he recommends as preferable either the insoluble bismuth salts in oil suspension or the fat-soluble compounds, as they are relatively comfortable and act over a considerable period while the water-soluble salts have various disadvantages such as toxicity, painful reactions, and too rapid elimination. He favors the fat-soluble compounds particularly in that they stand between the rapid absorption of the water-soluble and the too long storage of some of the insoluble preparations. For the treatment of interstitial keratitis Wright and Perlman[19] are convinced that the results are better from the use of bismuth in conjunction with the arsenicals.

On the subject of reactions White[20] reports two cases of rare keratoses of palms and soles as a cutaneous reaction from neoarsphenamine after a second dose. Cannon[21] reports a series of cases of jaundice, dermatitis, and neuritis following arsphenamine treatment. Of these, about 38 per cent had a complete permanent reversal in serology after the reaction; 19 per cent showed improvement. Some of these cases were followed from three months to twelve years. There seemed to be no relation between this serologic change and the severity of the fever or the dermatitis. In the neuritis cases there was neither fever nor skin irritation, yet the percentage of negative Wassermann reactions following was higher than after either jaundice or dermatitis.

Although severe dermatitis from arsphenamine occurs in only a small percentage of cases, Chargin, Sulzberger, and Crowley[22] consider it of paramount importance, particularly since the eczematous type of eruption accounts for the greatest number of deaths due to arsenical medication. The authors experimented to find a means of determining in advance whether a given patient is prone to react with a dermatitis on the administration of arsphenamine. The contact test by means of an impregnated patch was the method that seemed most suitable for a number of reasons. They reached certain conclusions: that from 17 to 21 per cent of persons not previously treated with arsphenamine reacted to the contact test; that if there were any difference in sensitiveness between syphilitic and nonsyphilitic patients, the former were slightly less sensitive; that in none of the patients who had positive reactions to the contact test did dermatitis develop on subsequent intravenous injections of arsphenamine but in two who had not had positive reactions, it did develop; that the contact test as used in their study does not indicate whether arsphenamine dermatitis is likely to develop in a patient.

Garnier[23], using 0.1 cc. of a 1:100 solution of arsphenamine, studied the intradermal reactions to it in patients who had had arsphenamine dermatitis. He found that of twenty-one patients all showed positive reactions and in some cases as late as two years after the dermatitis.

The treatment of gumma of the brain is discussed by D'Aunoy, Friedrichs, and Zoeller[24], who consider that the result of antisyphilitic treatment alone is commonly not very satisfactory and that an early decompression is frequently indicated to relieve intracranial pressure and that surgical removal is the treatment of choice. They feel that specific treatment for the sake of the individual is never to be neglected but that for actual reduction of the tumor or as a therapeutic test it is disappointing.

That all dyspeptics with a suspicious history of syphilis should have that diagnosis considered as a basis for their complaint and be given at least a few treatments is the belief of Clasen[25] who considers gastric syphilis much more common than it is ordinarily regarded to be and because not suspected, often overlooked. He advises that every case of gastrointestinal symptoms should have a complete neurologic and serologic examination.

IN GENERAL

It is unfortunate that slipshod methods such as the dismissal of a young girl with the diagnosis of aspirin rash because the doctor had known her since she was a baby and knew she was a "nice" girl, and the dismissing of the possibility of primary syphilis because one Wassermann reaction taken in the first week of the chancre is negative are still prevalent among

physicians who are not interested in syphilis. The treatment of early syphilis with a half-dozen injections and a few pills is altogether too prevalent and while Madden presents nothing truly new, it is timely and much worthwhile to reiterate that proper treatment of late syphilis is the prompt treatment of early syphilis. He finds that of a group of 500 cases of late syphilis only two had had energetic treatment during the first year. He urges more time under competent doctors devoted to the study of syphilis in our medical schools.

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COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1931 AND SEVEN YEAR AVERAGE

MONTH ENDING JULY 23, 1932

Diseases	1932 Week ending July 2	1932 Week ending July 9	1932 Week ending July 16	1932 Week ending July 23	Average cases reported for week corresponding to July 23 for past seven years	1931 Week ending July 4	1931 Week ending July 11	1931 Week ending July 18	1931 Week ending July 25
Anthrax	—	—	—	—	—	—	1	—	—
Cerebrospinal Men.	—	—	—	2	2	2	1	—	—
Chicken Pox	90	24	68	29	16	31	30	14	12
Conjunctivitis Inf.	—	2	—	—	—	—	—	—	—
Diphtheria	4	1	1	1	13	10	5	8	9
Dysentery Bacillary	—	—	—	—	—	—	—	—	1
Encephalitis Epid.	—	—	—	—	—	—	1	—	2
German Measles	6	2	2	1	3	—	1	3	3
Influenza	2	1	5	6	—	1	—	1	—
Malaria	—	—	—	—	—	—	—	—	1
Measles	133	100	66	75	56	131	110	133	55
Mumps	39	21	20	19	8	15	34	7	20
Paratyphoid Fever	1	—	—	—	—	2	—	—	—
Pneumonia (Broncho)	7	9	12	15	12	12	10	7	6
Pneumonia (Lobar)	7	12	15	5	10	4	6	7	8
Poliomyelitis	1	1	—	2	1	2	7	5	11
Scarlet Fever	34	17	25	16	14	22	19	16	9
Septic Sore Throat	—	—	1	2	—	1	3	1	—
Tetanus	—	—	1	—	—	—	1	—	—
Trichinosis	—	—	—	—	—	—	1	—	—
Tuberculosis (Pul.)	27	25	29	24	29	29	27	26	48
Tuberculosis (O. F.)	5	—	1	2	3	3	5	3	6
Typhoid Fever	1	2	2	2	2	1	1	4	1
Undulant Fever*	1	—	—	1	—	1	1	1	—
Whooping Cough	98	110	82	87	62	74	63	70	58
Gonorrhea	37	22	33	19	30	47	25	26	30
Syphilis	37	22	41	63	27	54	37	24	27

Remarks: No cases of Asiatic cholera, glanders, plague, or yellow fever during the past seven years.

*Made reportable August 14, 1928.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 18321

PAIN IN THE CHEST, CHILLS AND LEUKOPENIA IN A MAN OF FORTY-SIX

MEDICAL DEPARTMENT

PRESENTATION OF CASE

DR. ALFRED O. LUDWIG*: This is the case of a forty-six year old post office clerk who was unemployed for a year before entry. The chief complaint was severe stabbing pain of sudden onset in the right upper chest which started six days before entry. With the onset he had a severe shaking chill. He had felt very ill ever since that time. He had had no cough until the day before he came in. He raised a small amount of rusty sputum. He had vomited a good deal since the onset of the illness. He vomited everything taken the day before he came in. He had had a loose watery diarrhea, three movements a day. He had had severe headaches and generalized aches in all the muscles and joints.

The family history is irrelevant. He had been married for twenty-two years and separated from his wife for seventeen years. Two children were living and well.

There is a history of occasional overuse of alcohol.

It is interesting to note that in the past history he mentioned having had what he called "lung fever" three times, each time with pleurisy. We assumed that these were attacks of pneumonia. He had lost 25 pounds in the past year.

Physical examination showed a fairly well developed and nourished man. The skin was dry and hot. There was slight cyanosis of the lips and fingers. There was considerable caries of the teeth. The throat and tonsils were slightly red. There was slight respiratory lag in the right chest. There was dullness with increased tactile fremitus and increased voice and breath sounds at the right apex anteriorly and posteriorly. The signs were most marked in the right axilla, where there was a loud bronchial whisper also. The heart borders were not accurately percussed because of hyperresonance on the left side of the chest. The blood pressure at entry was 118/80. He had slight to moderate sclerosis of the peripheral vessels. There was slight costovertebral tenderness on both sides, more marked on the left.

The white blood cell count was 3,350, 67 per cent polynuclears and 17 per cent band forms.

We thought he probably had lobar pneumonia of the influenzal type, considering the low white count.

The temperature was 104.8° at entry. It came down at first, then rapidly rose to 104.5° by rectum. On the fifth day after entry at three o'clock in the morning he had a sharp drop in temperature to normal with slight falling of the pulse and respirations. He did not improve with his apparent crisis; in fact he looked much worse. The white cell count during his stay in the hospital had risen from 6,100 the day after entry to 13,000 three days after entry, and had fallen again to 6,200 the day before death. One more differential had been done the day after entry, at which time he had a total neutrophile percentage of 90 of which 52 per cent were band cells. On the day of his death, following the drop in temperature he was found to have loud bronchial breathing all over his right back. Both sides were filled with loud bronchial râles.

Two portable films were taken. The first one showed a process limited to the right middle lobe. The second one showed the whole right side obscured by homogeneous dullness. We thought there was no doubt that the process had extended to the right upper and right lower lobes, and we thought there might be fluid there. We also thought the fall in temperature might have represented either a pseudocrisis or a crisis due to the process in the middle lobe. He died on the afternoon of the sixth day in the hospital, after having been comatose for several hours. The pulse and respirations fell; the temperature steadily rose.

DR. WILLIAM B. BREED: Did you give him any antipneumococcus serum?

DR. LUDWIG: We did not give any serum.

CLINICAL DISCUSSION

DR. FREDERICK T. LORD: What type was the organism by mouse?

DR. LUDW[illegible] It was type II by mouse and by blo[illegible]ture.

DR. [illegible]REED: In this case we had a group of symptoms and a sign which often indicate a bad prognosis; namely gastro-intestinal symptoms, particularly the vomiting, and the rather persistent low white cell count. Of course, not having entered until seven days after the onset he had undoubtedly rather neglected himself so far as treatment was concerned. When he first came in we all felt that the prognosis was very bad in spite of the fact that only one lobe was involved. Otherwise there was nothing of an unusual nature about this case.

A PHYSICIAN: What was your treatment, Dr. Breed?

*Recently senior interne on the East Medical service.

DR. BREED: It was supportive treatment, treatment of the acute infection, nothing more specific. We did not give him digitalis. That brings up a very interesting point in the treatment of pneumonia, the question of the use of digitalis in the absence of any signs of congestive failure or auricular fibrillation. I have always felt that we do not know what digitalis does to people with acute infections in the absence of congestive failure, and therefore the conservative point of view has been for me, at least, more satisfactory. At Bellevue Hospital in New York, Niles and Wyckoff* conducted an experiment on the use of digitalis in pneumonia, using a control group with all types of pneumococcus and patients of all ages, and came to the conclusion that digitalis is of no value in this disease. In fact there was some evidence that in the presence of infection and fever digitalis may be harmful.

DR. TRACY B. MALLORY: How often have you seen the onset of fibrillation in pneumonia in cases with previously normal rhythm?

DR. BREED: I remember one case of type III pneumonia in an old man who recovered. There was transitory fibrillation which yielded to intravenous treatment with digalen. Following his crisis he had no more signs of heart disease than a man of his age should have. The subsequent winter he went through another attack of type III pneumonia without any cardiac difficulty or arhythmia and without digitalis therapy.

DR. LORD: With respect to the occurrence of fibrillation, it occurs in about 3 per cent of the cases. It was our custom earlier to use digitalis as a routine, but now for a number of years we have not done so. The argument in its favor is that fibrillation does occur in a small proportion of the cases and one might regard it as somewhat of a safeguard to have the patient already digitalized. On the other hand it means subjecting a large number of patients to digitalis without the likelihood of benefit. There also seems to be plenty of time to use digitalis on a pneumonia patient when he does have fibrillation. So that my feeling about it is that it is undesirable to treat such patients with digitalis as a routine.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Lobar pneumonia, type II.

ANATOMIC DIAGNOSES

Lobar pneumonia, type II, all lobes of the right lung and middle portion of the lower lobe of the left lung.
Adhesive interlobar pleuritis, right.
Acute fibrinous pleuritis with effusion, slight, right.
Fibrinous pericarditis with effusion, slight.
Dilatation of the heart, slight, right.
Septicemia, pneumococcus, type II.

PATHOLOGIC DISCUSSION

DR. MALLORY: The autopsy in this case showed, as was expected, a very massive lobar pneumonia on the right. We were not able to make out any obvious difference in the stage of pneumonia in the various lobes of the right lung. They all showed a well marked long-standing gray hepatization. The clinical evidence that the process started in the middle lobe is very good, but anatomically there was not much difference between the middle lobe and the other two lobes on the right. On the opposite side there was a definite fresh extension of the process to the lower lobe, this time a red hepatization, probably of only two and a half to three days' duration.

There was one other finding which is one of the other standard complications of lobar pneumonia that one always looks for in a certain percentage of cases. That was an acute pericarditis. The usual things which can happen in pneumonia other than mere extension of the process are of course empyema, pericarditis and endocarditis. There are other more remote possibilities, but those three things are all relatively common. In any fatal case we stand a pretty fair chance of finding one of them.

DR. LORD: May I say a word about the occurrence of abscess as a sequel to lobar pneumonia. One would think theoretically that the resolving process might be upset and not take place normally and that in consequence necrosis might occur. Rather surprisingly, however, on analysis of cases of abscess there is little evidence in favor of an origin from true lobar pneumonia. In that small group of cases which seem to go back to pneumonia the evolution and grouping of the initial symptoms are only rarely those of true lobar pneumonia. I think it is rather questionable whether true lobar pneumonia does terminate in abscess.

DR. MALLORY: I should certainly agree that lobar pneumonia is a rare precursor of chronic lung abscess. On the other hand at postmortem examinations I have certainly seen pathologic pictures which could only be interpreted as abscess formation. They are most common in cases of unresolved pneumonia which have gone ten or fifteen days without a crisis. Those cases are rather infrequent and I suspect that in very few of them do the patients live long enough for the clinical picture of lung abscess to develop. Theoretically it is a valid cause of lung abscess, but practically a very uncommon one.

*Walter L. Niles and John Wyckoff, Studies concerning digitalis therapy in lobar pneumonia. Am. J. M. Sc. 180:348, 1930.

CASE 18322

LOBAR PNEUMONIA IN A CASE OF DIABETES MELLITUS

MEDICAL DEPARTMENT

PRESENTATION OF CASE

DR. HUGH MONTGOMERY*: *First admission.* This case is that of a man sixty-two years old, a Greek barber, who came in to the Surgical service complaining of a black toe of six days' duration.

The first symptoms that we know about were six years before entry, when his right little toe was amputated because of gangrene. The wound did not heal readily, and a piece of the fifth metatarsal bone had to be removed at a subsequent operation. The wound had never remained completely healed. Every two or three months it broke down and discharged pus. Three years later a Gritti-Stokes amputation of the left leg just above the knee was done because of gangrene of the foot.

Physical examination at the first entry was roughly negative except for the local trouble. No pulsating arteries were found in the right leg and foot below the upper femoral. An x-ray of the foot was thought to show osteomyelitis of the fifth metatarsal. At that time the amputation wound of the left leg was perfectly healed.

A Gritti-Stokes amputation of the right leg was done. The wound healed rapidly. His highest blood sugar during that time was 310. It came down under insulin and diet. A month before he was discharged he had dullness, diminished voice and breath sounds and râles at the right base posteriorly, which after two or three days disappeared. He was discharged sugar-free as to his urine, with a blood sugar of about 168.

History of interval. After leaving the hospital he got along very well on a diet without insulin. For six days before his reëntry he had chills, cough and difficulty in breathing. He had been up and down, not really in bed, during that time and had been sweating constantly. He had been raising some slightly yellowish but fairly normal appearing sputum. There was no blood in it. The blood sugar at that time was about 300.

Second admission. He came in on the East Medical service four months after his previous discharge.

Physical examination at reëntry showed dullness at the left base with diminished spoken voice and fine crepitant râles halfway towards the apex on the left side and going around to the lower axilla, evidently at that time involving the lower lobe at least. He was dyspneic and looked quite ill.

*Recently senior interne on the East Medical service.

He had an elevated temperature. The first reading was 104°.

The sputum was type IV pneumococcus by mouse test. A blood culture was negative. The white cell count on admission was 22,000 and ranged from 23,000 to 17,000. He had a slight trace of albumin in the urine. On admission there were many fine granular casts. He was putting out a fair amount of urine.

He was given insulin at first by the four period test and yet the blood sugar rose on the third day to 424. Larger doses of insulin made him somewhat dehydrated and he had to have fluid given intravenously at the same time, 2½ and 5 per cent glucose, heavily covered by large doses of insulin. Before discharge the blood sugar had dropped down to 200 again.

The fever started at 104°, falling to 102.5° the second day and then climbing rather irregularly to 105° on the fourth day. Then he had a sharp drop in temperature to a little above 99° on the fifth day, with a corresponding drop in respirations and pulse. He felt and looked better. We thought it might be the crisis. The next day however his temperature rose to the point where it was the day before the drop and he looked very ill. On the ninth day he died.

DR. WILLIAM D. SMITH: Wasn't he the man who developed nitrogen retention?

DR. MONTGOMERY: Two days before he died the non-protein nitrogen was 93.

DR. TRACY B. MALLORY: One other point that I think was not mentioned is that at the time of autopsy there was definite though slight jaundice.

DR. GEORGE W. HOLMES: The films taken at the first entry show a rather high, sharply domed diaphragm on both sides and a moderate amount of tortuosity of the aorta. There is no enlargement of the heart. There is nothing definite in the lung fields.

On the film taken at the second entry there is homogeneous dullness throughout the lower part of the left lung field without displacement of the heart or marked changes in the position of the diaphragm or the ribs. That appearance is consistent with consolidation. The question might arise as to whether the process is in the upper or the lower lobe. We can see a bright area just above the diaphragm. Dullness as low as that would I think be in the lower part of the upper lobe rather than the upper part of the lower lobe.

CLINICAL DISCUSSION

DR. SMITH: I should like to ask one question. Is it common in the course of a fatal illness for a person to accumulate nitrogen in the blood without obvious or serious kidney damage? I have seen it in the wards now and then where there seemed to be no question at the start of real nephritis. It appeared as the patient got

worse and accumulated nitrogen in the blood.

DR. FREDERICK T. LORD: Systemic intoxication is capable of depressing kidney function with consequent elevation of non-protein nitrogen in the blood. Cohn (*Deut. Med. Woch.*, 1922, Feb. 16, 48, p. 226) found over 45 mg. in 34 of 55 patients with pneumonia. The high values may drop after recovery. Dehydration may also be responsible for concentration of non-protein nitrogen in the blood.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Lobar pneumonia.
Diabetes mellitus.

ANATOMIC DIAGNOSES

Lobar pneumonia, left lower lobe.
Septicemia, pneumococcus type IV.
Fibrinous pleuritis.
Atrophy of the pancreas (diabetes mellitus).
Arteriosclerosis.
Coronary sclerosis, slight.
Bilateral amputation of the legs.
Jaundice.

PATHOLOGIC DISCUSSION

DR. MALLORY: Autopsy showed extensive lobar pneumonia which at the time of autopsy completely involved the left lower lobe. The lung weighed 1700 grams, which is about the same size as his liver. Of course three-quarters of that weight was made up of the consolidated lobe. When we compared the x-ray film with the anatomic specimen it seemed rather surprising that the process did not look bigger in the film.

Otherwise there was very little found. He had a slight degree of atrophy and chronic fibrosis of the pancreas, about the degree often seen in diabetes but equally often without diabetes.

Surprisingly enough with the story of bilateral gangrene, the aorta was perfectly smooth and the coronaries were good. The kidneys showed very little. I was also interested, in view of the jaundice, which was quite definite I think on the autopsy table, to find that as usual the liver was perfectly normal. So far as I know there is nothing known of the mechanism of jaundice in these cases. We sometimes get extreme jaundice with a liver which is perfectly negative histologically. We know that the pneumococcus contains a hemotoxin having a lytic action, but it has not definitely been proved that it causes significant hemolysis in human pneumonia. Do you know whether there is any definite work on that, Dr. Lord?

DR. LORD: No.

What was the type of the organism?

DR. MALLORY: It was type IV pneumococcus.

DR. LORD: Was it lobar or bronchopneumonia?

DR. MALLORY: It was lobar, limited to the left lower lobe.

DR. LORD: There is I think some ground for the belief that types I, II, and III pneumococcus give rise to the lobar type of pneumonia and type IV and other organisms give rise to bronchopneumonia. It certainly is true that when one analyzes cases clinically those with a typical explosive onset such as we see in lobar pneumonia, with chill, pain in the side, bloody sputum and rapid elevation in temperature, do in great measure turn out to be due to I, II or III pneumococcus, and those with the atypical onset by contrast turn out to be caused by type IV and other organisms. Of course the finding of type IV pneumococcus in the sputum is subject to the error of its presence in the normal mouth, and repetition of the test on a specimen of sputum from the lung itself raises the percentage of cases in which types I and II are found. This patient had a rather atypical onset.

DR. MALLORY: It is perfectly possible that he may have had bronchopneumonia which rapidly became confluent so that it would be indistinguishable from true lobar pneumonia at autopsy.

DR. LORD: It would seem desirable to obtain further evidence on this matter. Correlation of the clinical picture with the bacteriology of the sputum suggests that lobar pneumonia is usually due to the so-called fixed types (I, II and III), but the normal presence of type IV in the mouth introduces a margin of error in the correlation. Determination of the bacterial cause by blood culture or the examination of empyema fluid offers more reliable evidence. Pneumococci other than types I, II and III are rarely the cause of empyema complicating true lobar pneumonia. Of 72 cases reported by Gundel (*Zentralb. f. Bakt. Parasitenkunde und Infektionskr. erste. Abt.* 122, orig. 1931, p. 112) type I was found in 54, type II in 16, type III in 2 and type IV in none. It would be well to extend the investigation to postmortem material and correlate the bacteriology of the lung at autopsy with the gross and histologic picture of true lobar pneumonia on the one hand and bronchopneumonia on the other.

DR. HOLMES: It was certainly not a complete involvement of the lower lobe at the time that film was taken.

DR. LORD: From the point of view of specific treatment, the finding of type IV in the sputum from a patient with typical lobar pneumonia clinically should call for an immediate repetition of the test on a satisfactory specimen. We ought always to insist that the patient bring up sputum from below.

DR. MALLORY: I notice that every year when we have occasion to check the typing on the sputum with the blood cultures taken in the wards or at the autopsy table we have a number of cases which show type IV in the sputum when they first come in which later turn out

to be I's and II's. I agree with Dr. Lord that type IV is not a very conclusive report. We always wonder if we may be wrong.

CASE 18323

RECURRENT PULMONARY SYMPTOMS

Medical Department

Presentation of Case

Dr. Alfred Kranes*: This is the case of a sixty year old Scotch laborer who came into the hospital complaining of general malaise, pain in the right chest, dyspnea and cough of between five and ten days' duration.

Thirty-five years previously he had an attack of right sided pleurisy and pneumonia which kept him in bed for seven weeks.

First admission. After that he was well until twenty-six years before his final entry, when he came into the hospital complaining of severe pain, malaise, generalized aches and pains and some cough of nine days' duration.

When he was examined there was dullness at both bases with many râles. There was a moderate temperature, not over 101°. He remained in the wards for three weeks and was discharged well, with a diagnosis of unresolved influenzal bronchopneumonia.

Second admission. He remained fairly well for five years. Then he returned with the story that two days prior to entry he suddenly awakened from sleep with a severe chill, pain in the right side, fever and cough with whitish sputum.

When he entered the hospital all the typical signs of lobar pneumonia in the right lower lobe were found. He remained on the medical service for three weeks, running a high temperature and not improving. Signs of fluid appeared at the right base. He was transferred to the surgical service, where a rib was resected. He remained there draining thick creamy pus for seven weeks more. He was discharged in fairly good condition.

Third admission. He returned to the hospital a year later with a story of cough and pain in the right chest. We know he did not have any fever at this time. There was dullness in the right chest. There were no râles, fever or leukocytosis. He was discharged with a diagnosis of chronic pleuritis and acute fibrinous pleurisy.

Fourth admission. Six years later, fourteen years before his last entry, he returned for repair of a left inguinal hernia.

Fifth admission. This time his complaint was that ten days before admission he had general malaise, some headache, and vague intermittent pain in the right chest. He kept on working however. Five days before admission the pain grew worse and was aggravated by respiration. He began to cough and raised a little brownish sputum. Four days before admission he vomited once and fainted. He gave up his work and lay about the house, not in bed. He gradually grew worse. He did not call a doctor until the day before admission. The doctor made a diagnosis of pneumonia and advised him to enter the hospital.

When he was seen in the Emergency Ward he was sitting up in bed, cyanotic and breathing rapidly. He came in the evening, so we did not notice jaundice until the following day in the ward. He was definitely jaundiced then. The right upper chest in front was dull. Practically the whole right posterior chest was dull. The lower part anteriorly was hyperresonant. He did not move the right chest at all. Tactile fremitus, voice sounds and breath sounds were increased all over the dull area and voice and breath sounds decreased in the right axilla. Egophony and numerous fine râles were present.

The white blood count was 15,000 at entry, 18,000 on the following day. The differential was roughly normal except that he had between 85 and 90 per cent polynuclears and 3 to 6 per cent very young cells described as myelocytes. The icteric index was 30. A van den Bergh showed 11.6 milligrams of bilirubin per 100 cubic centimeters, direct reaction.

The temperature was 103° and remained about that until the end, when it suddenly dropped to normal. The pulse was about 100, with a terminal rise to 160. The respiration was 50 at entry, dropping to normal.

He gradually grew worse. On the second day he was delirious and very cyanotic. He was put in an oxygen tent. His color improved rapidly, but his general condition became poorer. On the day of death the white cell count was 37,000. The temperature suddenly dropped and he died.

The sputum by mouse typing was type I pneumococcus. Two blood cultures showed type I pneumococcus. Inasmuch as he came in between the fifth and the tenth day (we could not be sure of the exact time of onset) we did not give him any serum.

Dr. George W. Holmes: The films were both taken on the same day. The diaphragm did not move at all on the left and moved very little on the right. There is homogeneous dullness on the right extending from the apex to the border of the septum between the middle and upper lobes, so that we have dullness throughout the whole of the right upper lobe. Then we have a dull area which corresponds with the lower lobe. That might have obscured the lung markings and the right border of the heart. The whole lower lobe might be dull and the whole shadow of the air-filled middle lobe might be obscured by the overlying shadow.

*Recently senior interne on the West Medical service.

There is no displacement of the heart. The appearance of the x-rays is that of pneumonia of the right upper lobe and probably of the lower.

Dr. Frederick T. Lord: With respect to the serum therapy of pneumonia, I think it is fair to say without going into detail that the mortality of type I pneumococcus pneumonia, treated within the first few days of the illness, is reduced about one-half, and that a favorable result is to be expected in type II.

The State Department of Health[1], which is as you know conducting a study of pneumonia with the assistance of a grant from the Commonwealth Fund of New York, has set up in the State a number of units with laboratory facilities and collaborators in the medical profession and is offering opportunities for the application of specific therapy in selected parts of the State. This is an important project and should be watched with great interest. It is the only project of the sort which has ever been undertaken on a large scale.

To be successful, serum therapy must be used early. Our experience here with type I pneumococcus pneumonia suggests that when the treatment is used after the first few days it is not effective. It is fortunate with respect to the application of specific therapy that lobar pneumonia due to types I and II usually has a characteristic onset, an explosive onset with pain, cough, bloody sputum, chill and rapid elevation of temperature. Even before the appearance of physical signs we have good reason to believe under these circumstances that we are dealing with a type I or II lobar pneumonia. So far as the determination of type without sputum examination is concerned, it must be granted that it cannot be done. On the other hand it can be said that male patients between twenty and fifty years of age with typical explosive onsets are very likely to be I's or II's. I think we ought to be attentive to this matter of clinical characterization, because it is part of the State project and it has been our policy in this hospital to treat these typical cases before typing, in order to save the time it would take to determine the type.

Under the older mouse method the time required for typing varied from five to twenty-four hours, but with the Sabin slide agglutination test[2] the time can be much shortened and a diagnosis of type can often be made after three to four hours. If the number of pneumococci is insufficient at the first examination of the peritoneal fluid of the mouse, hourly samples can be taken until enough pneumococci are present for the agglutination test. This method is applicable to small amounts of sputum. If large amounts are obtainable, an immediate diagnosis of type may be made by the Krumwiede precipitation test[3]. If the time element were not of such importance, it would of course be best in all cases to determine the type first and carry out serum therapy after the type is known. It should be appreciated, however, in the investigation of patients with typical lobar pneumonia that a satisfactory specimen of sputum should be obtained and the determination of type started at once, and that by the application of these more rapid methods in an easily accessible laboratory there need be no serious loss of time. Satisfactory specimens of sputum are usually obtainable if the physician is sufficiently insistent, and we should now, I think, defer the specific treatment when to wait for the determination of type means a delay of only a few hours.

In the selection of patients for treatment from a clinical point of view it is important to appreciate that certain patients with pneumonia can be excluded as unlikely to have type I or type II infection. Pneumonia as a postoperative complication, or occurring in the course of a circulatory disturbance, or in infants, children or the elderly is not likely to be due to these two types.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Lobar pneumonia.
Pneumothorax.
Empyema?

ANATOMIC DIAGNOSES

Lobar pneumonia, right, with extension to the left, pneumococcus type I.
Marked fibrous pleuritis, right.
Slight left hydrothorax.
Adhesive pericarditis.
Jaundice.
Moderate aortic and coronary arteriosclerosis.
Slight renal arteriosclerosis.
Congenital absence of the right kidney and ureter.
Septicemia, pneumococcus type I.

Pathologic Discussion

Dr. Tracy B. Mallory: One of the most interesting pieces of experimental work on pneumococcus infections that have been done in recent years was that of Goodner[4] working with rabbits. He found that by inoculating rabbits in the skin with pneumococci he could produce a localized inflammation running a course which from the temperature chart was astonishingly close to that of lobar pneumonia. If the dose was properly controlled the animals would remain five to seven days with a high temperature. Then the process would suddenly clear up with a crisis, just as pneumonia does. One of the advantages of this procedure was that he had the lesion on the outer surface of the body where he could watch it every day. At the

time of the crisis the local inflammatory lesion began to clear up very rapidly.

He went on to treat these animals with serum and found that he could produce excellent therapeutic results, but that the serum was very effective only in the first twenty-four or forty-eight hours, much less effectual later. An injection of 4 cubic centimeters or 0.23 per cent of body weight was considered adequate to abort infection at twenty-four hours. At forty-eight hours it required 0.47 per cent, and at seventy-two hours approximately 0.67 per cent. Calculating roughly the difference between the relative weights of rabbit and man, Goodner estimates that in a man of seventy kilos it would be necessary to use 150 cubic centimeters of serum at twenty-four hours, 325 cubic centimeters at forty-eight hours and approximately 475 cubic centimeters at seventy-two hours. One might then stand a pretty good chance with serum therapy taking the case within the first twenty-four or forty-eight hours. If the case is not treated until the fourth or fifth day the dose would have to be increased to nearly a liter in order to be effectual. It is always dangerous to compare results in one animal with those in another. Still, the parallelism in the courses of disease is so close that I think it is fairly probable that there is also some degree of parallelism in respect to the therapy of human pneumonia. If the process is much the same, as Goodner believes it is, that would explain the fact that the results of serum therapy are so doubtful in cases of four or five days' duration, whereas the results seem very striking indeed in occasional cases treated within three or four hours of the onset.

DR. F. DENNETTE ADAMS: Dr. Lord has stated that by using serum therapy within the first few days we can reduce the mortality of type I by probably 50 per cent, if I am quoting him correctly, and that in type II favorable results may be expected. May I ask if there are any figures to show that the serum has helped type II? I am particularly interested in knowing if there are any clinical statistics which support the latter statement.

DR. LORD: I put it in that way because our experience in this institution would seem to indicate that treatment of type I pneumococcus pneumonia is not in any degree favorable after the third day, but I cannot believe that that would be rigidly true. The State Department of Health demands that serum be used within the first four days. The most recent compilation of the results of treatment of type II pneumococcus pneumonia has been made by Cecil and Plummer[5]. In their series of 252 treated cases the mortality was 40.5 per cent. In 253 controls the mortality was 45.8 per cent More promising results have been recorded in the experience of others. It is probable that with type II as with type I the early application of specific treatment is essential for striking success. In 21 type II cases treated by Cecil and Plummer within 3 days of the onset the mortality was only 14.3 per cent against 65.0 per cent in 20 untreated controls.

In this connection attention may be called to an epoch-making discovery by Avery and Dubos[6], who have succeeded in isolating from peat soil an organism the enzyme from which specifically decomposes the capsule of the living type III pneumococcus both in media and in the animal body. This action is selective and does not affect the specific carbohydrates of certain other encapsulated bacteria. The decapsulated organisms are exposed to attack by the defenses of the host and results have already been obtained which encourage the hope that the enzyme will have important curative action against type III pneumococcus infection.

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THE JOURNAL OF PEDIATRICS

THE opportunity is granted of welcoming into the ranks of medical journalism another newcomer, *The Journal of Pediatrics*—"a monthly journal devoted to the problems and diseases of infancy and childhood." This infant is the more likely to survive since it has, for its parthenogenetic parent, the youthful American Academy of Pediatrics and for its skilled editorial accoucheurs Borden S. Veeder and Hugh McCulloch of St. Louis, abetted by a carefully selected and geographically distributed editorial board. With such a notable pediatric staff in attendance, the infant's welfare should be assured providing the consultants do not disagree too seriously.

Issue I of Volume I, making its appearance during the favorable seasonal conditions of a Missouri July, tips the scales at 144 text pages, and while there is a certain amount of pathology discovered in its body, such as a trace of Postanginal Sepsis contributed by Isaac A. Abt of Chicago; a definite strain of Undulant Fever in Childhood, furnished by Henry Dietrich and Charles W. Bonynge of Los Angeles, an infection of The Paranasal Sinuses in Scarlet Fever, supplied by A. Clement Silverman of Syracuse, and an unfortunate complication with Aneurysm of External Iliac Artery and Gangrene of Leg as Complications of Bacterial Endocarditis, by J. B. Bilderback of Portland, Oregon; there is also, we trust in time, An Aid in the Diagnosis of a Certain Type of Congenital Esophageal Stenosis, made by Mont R. Reid of Cincinnati.

To offset these disturbing elements we find that Marsh W. Poole and Thomas B. Cooley of Detroit have contributed The Care of Premature Infants; Arnold Gesell of New Haven, Pediatrics and the Supervision of Child Development, and Barnet E. Bonar of Salt Lake City a lengthy critical review on Problems of the Newborn. Let us hope that these may not be too many or too serious. In line with modern pediatrics, the child has already received its first immunization with a Trial of Toxin-Antitoxin Floccules (TAF) in Immunity Against Diphtheria, administered by Harold K. Faber and Mary I. Preston of San Francisco, and has rallied to The Effect of Vitamin D in Increasing Resistance to Infection, by Elizabeth Chant Robertson and John R. Ross of Toronto. Since this was supplied in the form of vitamin D or "sunshine" bread, we may assume that the infant is already taking nourishment. In case a certain common infection should occur, the child has already tested the effectiveness of Methenamine as a Urinary Antiseptic at Various Hydrogen-ion Concentrations, according to the formula of Henry F. Helmholz, of Rochester, Minnesota. Our own Dr. John Lovett Morse stands in the rôle of family practitioner with the American Academy of Pediatrics, Why and What For. This first attempt at parturition having been so successful, it is reasonable to assume that the Academy will not be without further issue.

The journal will no doubt in the future receive more careful editing; its contents so far as material is concerned are excellent. We hope that it will adopt a lenient stand toward the reviewing of books, will remain a clinical journal in contradistinction to the revered *American Journal of Diseases of Children,* and will remember that firmness of tissue is more to be desired than body weight; quality more than quantity.

ANNUAL REPORT OF THE MASSACHUSETTS GENERAL HOSPITAL

THE One Hundred and Eighteenth Annual Report of the Trustees of the Massachusetts General Hospital for the year 1931 bears witness to

the depression which was felt during that period throughout the country. A comparison of the average number of patients per day shows that there were in the General Hospital in

	1931	1930
Paying patients	61—	65+
Patients paying something	140+	150—
Free patients	179+	166+
Total	380+	381—

In 1931, of 138,906 patients' days 85,537 were free.

In 1930, of 140,236 patients' days, 83,525 were free.

Despite this reduction in income, more operations were done in 1931 than in any preceding year. There has been no curtailment in the activities of the hospital.

The number of patients admitted to the Phillips House (the unit for private patients) shows a marked decrease over previous years. Patients' days totaled only 19,706, whereas in 1929, the most active of the preceding nine years, they totaled 32,288 days. As might be expected, this deficit in patients was offset by a great increase in the number of patients admitted to the Baker Memorial (unit for people of moderate means) where there was an average of 125 patients per day compared with 87 patients per day in 1930. There was very little difference (210 against 213) in the number of patients in McLean Hospital in these two years; actually, there were more admissions during 1931.

There has been little change in the material equipment of the Massachusetts General Hospital, the Baker Memorial or the Phillips House, but at McLean, a new building for the housing of male nurses has been opened.

At the Phillips House, a surgical resident has been appointed. This is a new departure which will be much appreciated by the Staff.

The reports of the various heads of departments show gratifying evidence of scientific activity on the part of the staff. In the report of the General Executive Committee, several pages are devoted to a discussion of the advantages and disadvantages of special assignments. This report, while admitting the value of such intensive work, suggests that such assignments should be made only after the most careful scrutiny; there is danger in too great specialization, as it complicates the care of patients and confuses the medical students and House Officers, while long-continued assignments may outlast their period of productivity. "Our students and House Officers may with reason wish to recall the days of the teaching of the broad and fundamental principles of medicine at the bedside under the guidance of a Warren, a Bigelow or a Shattuck."

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

HUNT, HAZEL M. A.B. Director of Chemical Laboratory at the New England Deaconess Hospital. Address: New England Deaconess Hospital, Boston, Mass. Associated with her is

DEFRATES, JOSEPH S. Ph.D. Biochemistry, Harvard University, 1929. Associated with E. R. Squibb & Sons, Biological Laboratories. Address: 3 Curtis Place, New Brunswick, N. J. Their subject is "The Relation of Diabetes Mellitus and Cholelithiasis." Page 245.

HUDSON, H. W. JR. M.D. Harvard University Medical School 1925. Assistant in Surgery, Harvard. Assistant Surgeon, Boston Children's Hospital and Cambridge Hospital. Surgeon, New England Home for Little Wanderers. His subject is "Preventable Child Deaths. Acute Appendicitis." Page 255. Address: 66 Commonwealth Avenue, Boston, Mass.

EPSTEIN, SAMUEL H. A.B., M.D. Harvard University Medical School 1927. Assistant in Therapeutic Research, Boston Psychopathic Hospital. Assistant in Psychiatry, Harvard. Address: 484 Commonwealth Avenue, Boston, Mass. Associated with him is

MARVIN, FRANK WILLIAM. A.B., M.D. Harvard University Medical School 1914. Assistant Visiting Anesthetist, Boston City Hospital. Anesthetist, Newton Hospital and Boston Psychopathic Hospital. Address: 520 Commonwealth Avenue, Boston, Mass. Their subject is "Observations on Pentobarbital-Sodium in Lumbar Punctures, Convulsive and Manic States." Page 258.

TUCKER, S. CHASE. M.D. Dartmouth 1893. Surgeon, Josiah B. Thomas Hospital, Peabody. Surgeon, Danvers State Hospital. Consulting Surgeon, North Shore Babies Hospital. Medical Examiner Eighth District. His subject is "Anthrax, An Industrial Hazard. Report on the Surgical Treatment of Malignant Pustule." Page 260. Address: Peabody, Mass.

STEPHENS, ERNEST. A.B. Deputy Superintendent in charge of Secondary Education, Lynn, Mass. His subject is "The Three-Year Health Education Study in the Lynn English High School." Page 263. Address: 42 Franklin Street, Lynn, Mass.

SMITH, IVAN G. A.B., A.M. Superintendent of Schools, Danvers, Mass. His subject is "What Contribution May the Local Health Organization Render a Junior High School in Developing a Health Education Program?" Page 266. Address: Danvers, Mass.

CHEEVER, AUSTIN W. A.B., M.D. Harvard University Medical School 1914. Visiting Der-

matologist to the Beth Israel Hospital. Physician and Clinical Consultant, Department of Dermatology and Syphilology, Boston Dispensary. Assistant in Dermatology and Syphilology, Harvard Medical School. He writes on "Progress in Diagnosis and Treatment of Syphilis, 1930." Page 269. Address: 472 Commonwealth Avenue, Boston, Mass.

MISCELLANY

RATING OF PHYSICIANS IN A CIVIL SERVICE EXAMINATION

Of thirty-six physicians who took the civil service examination as a preliminary to appointment as medical inspector of the Boston Health Department, all but one were found to be eligible. This is an indication of general intelligence of this group.

Dr. Augustine W. McGarry received the highest rating. He is a graduate of Harvard University Medical School and is Assistant Professor of Clinical Pediatrics in Boston University Medical School.

SUIT DESIGNED TO PROTECT THE PETITIONERS WHO MANUFACTURE THE DRINKER RESPIRATOR

Suit alleging infringement of U. S. patent No. 1,834,580 has been filed in the United States District Court at Boston. The petitioners are Warren E. Collins, Inc., manufacturers of the Drinker respirator and the defendant is John Emerson, a manufacturer also of Boston. The patent was issued in 1931 to Philip Drinker and Louis Agassiz Shaw, inventors of the so-called Drinker respirator. Originally developed as an emergency apparatus for use in cases of drowning, asphyxiation, and the like, the Drinker respirator found its widest use in the treatment of cases of infantile paralysis in the epidemic which occurred in the fall of 1931. Another important application is initiating normal respiration in new-born babies who breathe with difficulty or not at all.

The reason for the present suit, according to the lawyer, who solicited the Drinker patent and who is handling the present litigation, is to guarantee to hospitals and to the public, the safe operation of the respirators from the standpoint of materials and tests which are involved in their construction and which the inventors feel a great responsibility to protect.

CORRESPONDENCE

A TRIBUTE TO MISS HARRIET DELAMERE

Honolulu, Hawaii, July 19, 1932.

Editor of The *New England Journal of Medicine*.

My belief that you will be interested in the following news item prompts me to send it:

Miss Delamere, who came to our Islands from the Massachusetts General Hospital, remained until she had given us as complete a training school as the one from which she had come.

When Miss Harriet Delamere had completed her work of organizing the school for nurses at the Queen's Hospital, and was about to say "Aloha Oe" (Farewell-to-thee) to her many friends, the many demonstrations of appreciation that were shown her, were, indeed, both timely and worthy of all that she had accomplished. Probably the one that touched her most deeply was the naming of a division of the new nurses' home in her honor.

Very truly yours,

J. CHRISTOPHER O'DAY, M.D.

A DISCOURAGED OUTLOOK

August 3, 1932.

The *New England Journal of Medicine*,
8 The Fenway, Boston.

My attention has just been called to the enclosed clipping in your *Journal*, as of July 28, 1932. I am afraid that Dr. J. N. Baker is right. As a matter of fact when he says "that there is a battle impending between the medical profession and predatory interests," he is not acting in the rôle of a discoverer, but is merely repeating doctrines which I have been preaching for many years. When he calls for leaders in this test which is coming, I am constrained to say from personal experience, that there is not very much incentive for a man to gird his loins for battle.

Yours truly,

JOHN J. HURLEY, M.D.

466 Commonwealth Avenue, Boston.

RECENT DEATHS

WELLS—JAMES LEE WELLS, A.B. Brown 1879, M.D., died in Brighton, Mass., July 13, 1932. He received his M.D. degree from the Harvard University Medical School in 1883 and was a member of the Massachusetts Medical Society from 1883 to 1914. His residence was in Boston at the time of joining the Society. He moved to 150 Warren Street, Roxbury, in 1884 and continued to live there during his membership in the Society.

CRONIN — DR. MICHAEL JOHN CRONIN of 5 Elm Hill Avenue, Roxbury, with an office at 520 Beacon Street, Boston, died August 7, 1932. He was born in Lawrence, Massachusetts, in 1870 and later lived in Haverhill. His degree of M.D. was conferred by the Harvard University Medical School in 1898 and he joined the Massachusetts Medical Society in 1899.

He was formerly a member of the staffs of St. Elizabeth's Hospital and the Boston City Hospital. He held membership in the American Medical Association. He leaves a widow Mary J. Cronin and three sons Hugh S., Paul M., and George White Cronin. Dr. Cronin had been incapacitated by illness for a long time.

HOCH — Dr. Theodore Augustus Hoch died in Northampton, August 4, 1932, at the Northampton State Hospital where he had been Superintendent for the past two years.

Dr. Hoch was born in Niles, Michigan, October 9, 1878, and graduated from the Medical Department of the University of Michigan in 1900.

He served at the Worcester, Mass., State Hospital and later became first Assistant Superintendent of the McLean Hospital at Waverley, Mass., for several years, also serving as Associate Commissioner of Mental Diseases in the Massachusetts State Department. He joined the Massachusetts Medical Society in 1907.

Dr. Hoch was a member of the Morning Star Lodge of Masons, the Worcester Chapter, Royal Arch Masons of Worcester, Mass., the Rotary Club of Northampton and of the St. John's Episcopal Church of Northampton. Dr. Hoch is survived by his widow, Mrs. Lenora (MacNiven) Hoch, one daughter, Mrs. Gerald Harrison of Boston, three sisters and a brother.

KILBOURN — Dr. Arthur Goss Kilbourn died in Groton, Mass., August 4, 1932, while preparing for an operation in his private hospital.

He was the recipient of the A.B. degree from Harvard University and the M.D. degree from the Harvard Medical School.

Dr. Kilbourn was born in Lancaster, Mass., on August 19, 1876. He prepared for Harvard at Phillips Exeter Academy and, following his medical education, served in Boston hospitals in preparation for practice. He settled in Groton twenty-six years ago and in 1907 founded his private hospital in that town, serving as physician to the Groton Academy for many years.

Dr. Kilbourn joined the Massachusetts Medical Society in 1908 and was prominent in the civic activities of Groton having served as Trustee of Lawrence Academy and held memberships in the Groton Lodge, I. O. O. F., the Groton Grange and the Groton Farmers' and Mechanics' Club.

He leaves a widow, Georgie Caroline Rogers Kilbourn, five sons, two daughters, a brother, several sisters and his mother who now lives in Lancaster, Mass.

REPORT OF MEETING

THE PLYMOUTH DISTRICT MEDICAL SOCIETY

The midsummer meeting of the Plymouth District Medical Society was held in Plymouth, Mass., at the Jordan Hospital on July 21, 1932. After a brief business meeting a beautiful and tender eulogy was read by Dr. W. B. Bannerman of East Bridgewater, chairman of the committee on resolutions on the late Dr. I. I. Richmond of East Bridgewater who had practiced in that town for over 30 years.

Directly after the meeting the society was addressed by Dr. Herbert H. Howard of Boston who spoke on the "Treatment of Ureteral Calculi." Dr. Loring B. Packard, x-ray specialist of the Brockton Hospital, spoke on the "Present Status of Gastro-Intestinal Diagnosis by X-ray" and illustrated his address by the aid of pictures furnished by Dr. A. W. George. The next speaker was Dr. Cadis Phipps of Boston who gave a very fine dissertation on the treatment of pneumonia. Following Dr. Phipps, Dr. John S. Hodgson spoke on "The Treatment of Cerebral Tumors and Ventriculograms." Dr. Hodgson gave a very splendid address. It is a very important subject and was very ably handled. The last speaker on the scientific program was Dr. Timothy Leary of Boston, Medical Examiner of Suffolk County, and Professor of Pathology at Tufts Medical College, who took for his subject "The Relation of the Medical Examiner to the General Practitioner." Dr. Leary went into details in dealing with this subject and related numerous incidents in the life of a medical examiner and his experiences. Dr. Charles G. Miles, president of the Plymouth District Medical Society, presided and introduced the speakers of the morning. After the meeting, Dr. George A. Moore, secretary of the society, and chief surgeon of the Moore Hospital, took moving pictures of the assembly. There was a very large delegation of doctors present.

After this the members of the society and their guests were driven by automobile to the Mayflower Inn, where a good dinner was served to the members and guests of the society. Seated at the head table were Dr. Charles G. Miles, president of the society; Secretary of State Frederick W. Cook; Vice President of the Massachusetts Medical Society Dr. Walter A. Lane of Milton; Executive-Assistant to the President of the Massachusetts Medical Society, Dr. Thomas J. O'Brien, who was the principal after-dinner speaker; Past Vice-President of the Massachusetts Medical Society, Dr. Thomas H. McCarthy; Dr. Cadis Phipps, Dr. John S. Hodgson, Dr. Alfred C. Smith, treasurer of the society; and Dr. George A. Moore, secretary of the society. After the dinner, Frederick W. Cook, Esq., secretary of the State of Massachusetts, spoke very briefly and brought greetings from the State Department of Massachusetts. Dr. Walter A. Lane, Vice-President of the Massachusetts Medical Society who represented the parent body, spoke on "the educational program that the State had outlined for the benefit of the general practitioners all over the state". He also spoke of the work of the Public Relations Committee. He said that he felt that this committee was most efficient and complimented Dr. Thomas H. McCarthy of Brockton, an active member of the Plymouth District Society, on the practical suggestions he had made for the benefit of this committee. The next speaker was Dr. Thomas J. O'Brien of Boston, Executive-Assistant to the President of the Massachusetts Medical Society, whose subject was "The Chiropractic Initiative," who spoke as follows:

Mr. President, The Honorable Frederick W. Cook and Members of the Massachusetts Medical Society:

The Massachusetts Medical Society was founded in 1781 and is the oldest medical society with a record of successive annual meetings in the United States.

In George Washington's time the expectancy of life was thirty-five years. In 1932 it is roughly fifty-eight years. This Society has always been most active in every movement of value which would result in the welfare and health of the public. Its influence has been felt in the formation of the State Board of Health, subsequently changed to the State Department of Health, and in the creation of the Board of Registration in Medicine as two important measures of fairly recent origin. The Board of Registration in Medicine was created in 1894. In 1909 osteopaths were permitted to take this examination as they had qualified by enlarging the curricula of their schools which included certain basic facts. For a great many years an osteopath served on this Board as its Secretary.

In 1922 the chiropractors introduced a bill asking that a board of chiropractors be created to examine them and regulate their practice. A joint committee on legislation representing the Massachusetts Medical Society and the Massachusetts Homeopathic Medical Society, with representatives of the Osteopathic Society, opposed this bill as unnecessary legislation and also because it conferred special privileges on the members of this particular medical cult. Our argument was brief, convincing and sound and in consequence this bill was defeated in that Legislature and in every Legislature since that date, although a bill of this character has been presented almost every year since the date referred to above. In the 1932 session the chiropractic petition was defeated in the House by a vote of 151 to 50 and in the Senate by 21 to 13.

We feel that there should be but one standard to decide the qualification of fitness of an individual to practice the healing art in this Commonwealth, namely, passing the examination given by the Board of Registration in Medicine. The present law is acceptable to the graduates of the so-called regular school, the homeopathic school and the osteopathic school. Our form of Government abhors class legislation and the chiropractors ask for special privileges. If an individual qualifies for the examination and is passed by the Board of Registration in Medicine, we feel that he should be permitted to practice the healing art in the manner in which he is best prepared, be it allopathic, homeopathic, osteopathic or chiropractic.

A multiplicity of Boards would be regrettable and when we realize that there are fifty-two medical cults and that many of these would ask for privileges similar to those of the chiropractors, one can easily picture the confusion which would result if other special forms of practice were given state recognition.

In an Editorial of the Boston *Herald*, June 30, 1932, the following statement was made:

"It is not necessary to argue the merits or demerits of chiropractic. We should not lower the bars for the benefit of those who cannot meet our reasonable requirements. New Jersey did that some years ago, and in one year 536 chiropractors were licensed. The next year New Jersey put the bars up again. The fact is undeniable that lower standards mean greater opportunity for the unscrupulous to exploit the public, and especially the poor and uneducated."

A member of the Surgical Staff of the Massachusetts General Hospital, who is a graduate of the Harvard Medical School and the School of Public Health of Harvard University, without disclosing his identity took a correspondence course with a chiropractic school in the Middle West and, after eighteen hours of study and the payment of one hundred dollars, received a certificate that the degree of "Doctor of Chiropractic" had been conferred upon him.

There are about forty-eight hundred members in our Society. We desire each physician to secure the active coöperation of the members of his family, his friends and tradesmen to solicit workers in opposition to the initiative petition. As the chiropractors term themselves "drugless healers" we should find it an easy matter to enlist the aid of pharmacists and nurses.

With the aid of our friends in the various civic, fraternal and social organizations, we should be able to roll up such an overwhelming vote that the members of the various medical cults would definitely understand that the voters of this Commonwealth require all who practice the healing art to comply with the present standard.

At the end of his remarks, Dr. Thomas H. McCarthy of Brockton was recognized by President Miles. He submitted the following resolutions:

"Resolved, that physicians of the Massachusetts Medical Society, Plymouth District, in meeting assembled, are strenuously opposed to the ratification of the initiative question which will appear on the ballot at the November election and which has for its objective a proposal to establish a special board to examine and license chiropractors.

"Resolved, that what the General Court has several times refused to do, the people of this state should themselves refuse, that the single standard for authority to be a practitioner in Massachusetts should be sustained, that an adherence of a school of practice, whether he is an allopath, homeopath, osteopath or chiropractor, may obtain a license now, provided he satisfies the State Board of Registration in Medicine of his qualifications and that once an applicant has proved his knowledge and training he may practice whatever system he pleases.

"Resolved, that it is our opinion that the chiropractors want a different and lower standard and that they want to admit persons to practice who are not qualified to meet Massachusetts standards. We feel that we should not lower the bars for the benefit of those who cannot meet our reasonable requirements and the granting to them of

an exclusive board would be a special privilege.

"Resolved, that the physicians of Plymouth District should exert all honorable and ethical measures within their power to influence their patients and the general public to reject this initiative petition for the fact is undeniable that lower standards in the practice of medicine mean greater opportunity for the unscrupulous exploits of the public, especially the poor and uneducated."

This resolution was unanimously adopted by the Society. After a few remarks from different members of the Society, the meeting adjourned.

The committee on arrangements for this meeting consisted of Dr. Thomas H. McCarthy, chairman; Dr. Edgar Hill of Plymouth; Dr. William E. Curtin of Plymouth; Dr. William T. Hanson of the Bridgewater State Hospital and Dr. Leonard Baker of Middleboro.

SOCIETY MEETINGS CONGRESSES AND CONFERENCES

September 19-22 — International Congress of Biliary Lithiasis. See notice on page 427, issue of February 25.
October 17-21—Clinical Congress of the American College of Surgeons. See page 1330, issue of June 23.
October 17-28—The 1932 Graduate Fortnight of the New York Academy of Medicine. See page 1375, issue of June 30.
October 22-24—Health Education Institute. See notice on page 47, issue of July 7.
October 24-27 — American Public Health Association. See notice on page 1321, issue of December 31, 1931.
October 24-28—Inter-state Postgraduate Medical Association of North America. See page 39, issue of January 7.

BOOKS RECEIVED FOR REVIEW

Épreuves Biologiques dans Les Ictères by François Thiébaut. Published by Masson et Cie. 192 Pages. Price 28 fr.

Collected Papers of The Mayo Clinic and The Mayo Foundation. Edited by Mrs. Maud H. Mellish-Wilson and Richard M. Hewitt. Volume 23. Published by W. B. Saunders Company. 1231 Pages. Price $13.00.

Traité de Physiologie Normale et Pathologique published under the direction of G.-H. Roger and Léon Binet. Tome VI—Circulation. Published by Masson et Cie. 592 Pages.

Materia Medica, Pharmacology Therapeutics and Prescription Writing by Walter A. Bastedo. Third Edition. Published by W. B. Saunders Company. 739 Pages. Price $6.50.

Studies from The Rockefeller Institute for Medical Research. Reprints. Volume 82. Published by The Rockefeller Institute for Medical Research. 624 Pages.

Quantitative Clinical Chemistry. Volume II—Methods by John P. Peters and Donald D. Van Slyke. Published by The Williams & Wilkins Company. 957 Pages. Price $10.

The Chemistry of Tuberculosis by H. Gideon Wells and Esmond R. Long. Second Edition. Published by The Williams & Wilkins Company. 481 Pages. Price $7.00.

The Medical Annual edited by Carey F. Coombs and A. Rendle Short. Fiftieth Year 1932. Published by John Wright & Sons, Ltd. and Simpkin Marshall, Ltd. Price 20/- net.

Papers on Surgery and Other Subjects by George Tully Vaughan. Published by W. F. Roberts Company. 408 Pages.

Accidents, Neuroses and Compensation by James H. Huddleson. Published by The Williams & Wilkins Company. 256 Pages. Price $4.00.

The Sign of Babinski—A Study of the Evolution of Cortical Dominance in Primates by John F. Fulton and Allen D. Keller. Published by Charles C. Thomas. 165 Pages. Price $5.00.

L'Hérédo-Syphilis clinique et thérapeutique by Dr. Jean Hutinel and Dr. Alice Ardoin-Linossier. Published by Gauthier-Villars et Cie. 302 Pages. Price 35 fr.

New and Nonofficial Remedies, 1932. Published by the American Medical Association. 492 Pages. Price $1.50.

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1931. Published by the American Medical Association. 100 Pages. Price $1.00.

The Anatomy of the Human Orbit and Accessory Organs of Vision. By S. Ernest Whitnall. Second Edition. Published by Humphrey Milford, Oxford University Press. 467 Pages. Price $6.25.

The Use of Lipiodol in Diagnosis and Treatment. By J. A. Sicard and J. Forestier. Published by Humphrey Milford, Oxford University Press. 235 Pages. Price $4.00.

Individuality of the Blood in Biology and in Clinical and Forensic Medicine. By Leone Lattes. Translated by L. W. Howard Bertie. Published by Humphrey Milford, Oxford University Press. 413 Pages. Price $7.50.

Nursing in Nervous Diseases. By James W. McConnell. Published by F. A. Davis Co. 153 Pages. Price $1.50.

Diabetes in Childhood and Adolescence. By Priscilla White. Published by Lea & Febiger. 236 Pages. Price $3.75.

A Guide to Birth Control Literature. By Norman E. Himes. Published by Noel Douglas. 46 Pages. Price 3s. 6d.

Principles of Chemistry. By Joseph H. Roe. Published by C. V. Mosby Co. Third Edition. 486 Pages. Price $2.50.

An Introduction to Dermatology. By Richard L. Sutton and Richard L. Sutton, Jr., Published by C. V. Mosby Co. 565 Pages. Price $5.00.

Your Teeth and Their Care. By Carl W. Adams. Published by C. V. Mosby Co. 141 Pages. Price $1.25.

Fungous Diseases. By Harry P. Jacobson. Published by Charles C. Thomas. 317 Pages. Price $5.50.

Community Health Organization. Edited by Ira V. Hiscock for the Committee on Administrative Practice of the American Public Health Association. Published by The Commonwealth Fund. 261 Pages. Price $2.50.